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Vol. I May 24, 1946 No. 20

UNITED STATES DEPARTMENT OF COMMERCE

HENRY A. WALLACE, *Secretary*

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# BIBLIOGRAPHY OF SCIENTIFIC AND INDUSTRIAL REPORTS

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ERRATA: PB 7743. FARAGHER, W. F. AND HORNE, W. E. MANUFACTURE AND REGENERATION OF CATALYSTS AT I. G. FARBENINDUSTRIE, LUDWIGSHAFEN, OPPAU. (FIAT FINAL REPORT 422) 1945. AVAILABLE FOR FREE DISTRIBUTION UNTIL SUPPLY IS EXHAUSTED. THEREAFTER, MICROFILM COPIES WILL BE AVAILABLE AT 50¢ - PHOTOSTAT COPIES AT $1.00. ABSTRACTED ON P. 679.

PB 7745. HORNE, W. A. AND FARAGHER, W. F. INTERROGATION OF DR. PIER AND STAFF, I. G. FARBENINDUSTRIE, A. G., LUDWIGSHAFEN, OPPAU. 1945. 40 P. PRICE: MICROFILM - 50¢ - PHOTOSTAT $3.00. ABSTRACTED ON P. 801.

## CHEMICALS AND ALLIED PRODUCTS

### Dyes

PB 17025. HAROLD, C. MORRIS. Observations on dyeing and finishing methods in Germany. n. d. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Much of the information on dyeing and finishing methods presented in this report came from the I. G. Farben laboratories and their technicians. Only one plant visited was in partial operation, the balance being closed down on account of damage, lack of fuel or supplies, or were classed as non-essential producers. Pigment dyeing, sulphurs, directs and diazotized dyes are discussed. It is claimed that with the new Developer A, of I. G. Leverkusen, acetate fibers are not stained, or if they are with certain combinations, the acetate will be only faintly stained the same shade as the dyeings. Details of the vat-acit, electro-fixier dyeing method are given. Although the plants visited were in general very poorly laid out, one modern plant was built in the form of an E, with a spur track along the open side. Goods were received at the bottom end of the E, entered the bleach house, and proceeded all around the E, through the dyeing, finishing, put-up and packing, to the upper open end where they went into railway cars or trucks.

PB 16157. ROBITSCHEK, P. O. Instructions for the preparation of the dyestuffs Filterblaugrün Spritlöslich and Filterblaugrün Wasserlöslich. (J.I.C.A. Rept 64) Feb 1946. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This report consists of two documents transmitted by J.I.C.A. from Germany, apparently from I.G.Farbenindustrie, Frankfurt -am-Maine - Höchst, the documents being dated Nov. 22, 1945. Their titles are "Vorschriff zur herstellung von filterblaugrün spritlöslich" and "Vorschriff zur herstellung von filterblaugrün wasserlöslich." The alcohol soluble dyestuff is prepared by action of ferric chloride upon 1-2 - naphthylenediamine and the water soluble by action of ferric chloride upon 1-2 - naphthylenediamine -5-7 - disulfonic acid.

### Detergents

PB 17223. SMITH, H. B., JR. Removal of impregnite from impregnated garments by solvent process. (CWS Tech Div Mems Rept 858) Jul 1944. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
Two solvents tested for the desimpregnation of O. D. wool uniforms were perchloroethylene and carbon tetrachloride. The latter was found feasible, being recovered in a simple distilling unit of high capacity and cheap construction. Engineering data were obtained to facilitate the still design. A diagram is given.

### Agricultural Chemicals

PB 22338. CROSSLEY, M. L. The protection of textiles and related products from damage by molds, fungi, insects and flame. (QM Textile Series Rept 4) Mar 1946. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
The object of the work covered by this report was to ascertain what was done in Germany to protect textiles, textile products and related materials from the destructive action of molds, fungi, insects and flame; also to report any new information about useful insecticides. Phenols and their chloro- and nitro- derivatives are the chief means of protecting textiles and related products. No means have yet been demonstrated to permanently mildew-proof textiles. "Bulan MK", made by condensing triphenyl phosphine with 3, 4-dichlorobenzyl chloride, may prove to be capable of giving the desired results. It, and related compounds, should be further studied as a mildew-proofing agent. The "Preventols" are suitable for preventing growth of molds in printing and finishing pastes but do not give textiles a protection which is resistant to rain and washing. The action of dinitrophenols in preserving wood appears to be enhanced by the presence of chromium, arsenic and fluorine compounds. "Basilit U. A." is such a mixture, claimed to give good protection against "dry rot". The "Bulans", seem to be the complete answer to the question of moth-proofing wool, furs, and related products. "Bulan" is taken up readily by the wool from a neutral bath and can be applied easily to the finished goods at any time, withoutaffecting their wearing properties or color. The "Bulans" have affinity for animal fibers and behave in some respects like acid dyes. They are fast to washing and light. "Bulan EK" gives protection against other insects, such as carpet beetles, which destroy animal fibers, and protects cellulosic materials against termites. The phosphates give good flame-proofing but no way was found to prevent their washing or leaching out. Sulfamide was substituted when phosphates were not available in Germany but the best results were still far from satisfactory. Bladan, a phosphorous organic compound, seems to be a useful insecticide for spraying vineyards, and is said to be effective against the red spider. "Lauseto New", a mixture of $C_6H_5SO_2CH_2Cl$ and $p\text{-}ClC_6H_4SO_2CH_2Cl$, behaves like DDT but is more effective against certain insects. Tetranitrocarbazole is the active component of the insecticide manufactured by Hoechst under the name "Kiresan", for use in place of lead arsenate. 1,8-dichloro-3,6 -dinitrocarbazol is also reported to be an effective insecticide, being developed at the Ludwigshafen plant. The processes for the manufacture of the "Bulans", tetranitrocarbazol and tetranitrobarbazol paste are covered in appendixes to the report.

PB 18915. HAWES, J..R. and LEA, F. M. Production of phosphate fertilizer by sintering of phosphate rock with sodium sulphate and lignite. (BIOS Final Rept 107, Item 22) Aug 1945. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Production trials in a pilot-plant at the works of the Lurgi Gesellschaft, Frankfurt a.Main, and agricultural trials of the subject fertiliser (known as "Lubeck" phosphate) had been made and were favorable, with one exception. The process had not been developed on a commercial scale, and the firm had not decided before the war whether to pursue it or not. The basis of the process is to burn a mixture of phosphate rock, sodium sulfate and brown coal in a reducing atmosphere. The nature of the reactions is not clear but the sulfate is reduced to sulfide sulfur, and this is apparently combined in a calcium sodium phosphate with partial replacement of oxygen by sulfur in the phosphorus pentoxide. The formula tentatively suggested is: $CaO.Na_2O.P_2O_3.S_2$, though the possibility that the sulfur may occur in the manner of apatite is not excluded. Tests indicated that neither calcium nor sodium sulfide were present in the product and that if sulfide sulfur was removed from the product by treatment with dilute sulfuric acid the solubility of the phosphorus acid in ammonium citrate was much reduced. A report, No. 1597, Nov. 19, 1936, of the Technisches Sekretariat of the Metallgesellschaft, gives details of the experimental work carried out in the laboratory and in small experimental kilns. Extracts from this report on the decomposition of phosphate with sodium carbonate and carbon are presented in the appendix.

PB 18459. TITUS, A. C. Report on application of fungicides. (NDRC Rept Miscellaneous - 5 Tropical Deterioration Administrative Committee Rept TDIC-67) Jun 1944. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This report deals with various complications which arise in connection with the application of fungicides. The fungicides are classified into three groups: (1) Chlorinated phenols and similar compounds; (2) rubber accelerator group; (3) mercury compounds.

PB 18458. U. S. NATIONAL DEFENSE RESEARCH COMMITTEE. TROPICAL DETERIORATION ADMINISTRATIVE COMMITTEE. Status report on the mildewproofing of CWS items (to Jul 1, 1944) (Misc Rept 4 TDIC-8) Sep 1944. 14 p. Price: Microfilm-50¢ - Photostat-$1.00

This report tabulated the results of tests which were conducted on Chemical Warfare Service items to which fungicides had been applied. Thirty-four commerical fungicides applied to cotton cloth were examined for suitability as mildewproofing compounds. Seven of the better fungicides were used to mildewproof waterproofed O.D. cotton duck. Cellophane, cellulose acetate, phoflim, coated fabrics, and coated papers were also tested. Photographs show growth of fungi on various materials.

PB 18600. U. S. WAR DEPARTMENT. MEDICAL CORPS. DDT insecticides and their uses. (Tech Bulletin MED 194) Aug 1944. Available from Supt. Documents. Price 15¢.
This bulletin is published as a special training and technical guide to the efficient, safe, and economical use of DDT as an insecticide. Dry DDT in concentrated form or when used mixed with inert powders is not absorbed through the skin, but since solutions of DDT in oils and organic solvents can be absorbed, contamination of the garments and of the skin must be avoided. Food, utensils, and table tops should be covered when spraying or dusting with DDT. Appropriate fire precautions should be observed when spraying with solutions since many of the solvents are inflammable. Air out treated rooms before reoccupation. DDT is specific in the control of flies, mosquitoes(adult and larvae), lice, fleas, bedbugs, roaches, and ants. A table attached to the report gives the method and amount to use, type (spray, powder, or emulsion), and place of treatment.

## Plastics and Plasticizers

PB 16600. CHASMAN, BERNARD. Fiberglas fabric filled CR-39 resin laminates. (AAF Eng. Div. Memo Rept ENG-56-M4400) Mar 1944. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
An analysis of the mechanical and physical properties of glass fabric filled CR-39 resin laminates and the effects of outdoor and accelerated weathering on some of the properties. Most of the specific properties of the subject laminate are lower than the desired specific properties for structural laminated plastics for facing materials in sandwich construction and semi-monocoque applications. The specific moduli of elasticity and the specific compressive strength are considerably lower. Flexural properties were not adversely affected by weathering tests, although water absorption and surface crazing increased. Appendices give test procedures, tabular results, and photographs.

PB 18296. I. G. FARBENINDUSTRIE. Allgemeines über Oppanol-folien als isoliermittel bei ingenieurbauten. (Generalities about Oppanol sheets as an insulating material for constructions.) Jul 1941. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an information letter to the manufactures sales offices within Germany. It describes the applications of this material especially for insulation and waterproofing and emphasizes the necessity to attend instruction courses sponsered by the manufactures for all men handling this material. In German.

PB 18288. I. G. FARBENINDUSTRIE. Bestimmung der zusammendrückbarkeit und der scherfestigkeit von Oppanol-CRG-folie. (Determination of the compressibility and shear resistance of Oppanol-CRG sheets.) (Enlargement of part of microfilm 178-1) Jan 1943. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
This report presents data on the subject tests requested by a user of Oppanol-CRG sheets, a trade-name for a poly-isobutylene polymer. The appendix contains tabulations and graphs. In German.

PB 18314. I. G. FARBENINDUSTRIE. Herstellung löslicher mischpolymerisate des methylvinylketons. (Preparation of soluble mixed polymers of methyl vinyl ketone.) (Enlargement print of part of microfilm 182-5) May 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This print has pages 1, 2, and 7 of a proposed patent application, dated May 5, 1942, under I. G. file number D1/Op. 106/Vo. These pages are crossed through and there is an additional page apparently containing the form of a proposed substitution. The claim is as follows: The application of solutions of cellulose esters as adhesive in the subsequent treatment of mixed polymers or vulcanized products of mixed polymers with methylvinyl ketone. In German.

PB 17340. I. G. FARBENINDUSTRIE. Igelit für die elektrotechnik. (Igelit for the electrotechnic.) (Enlargement print of part of microfilm 180-2) n. d. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an advertising pamphlet and describes the physical and chemical characteristics and used of Igelit, a trade-name for a polyvinylchloride plastic. Suggested uses are as insulation for wire and cable for use with electric currents of up to 1 K.V. Plasticizers suitable for this use are given. In German.

PB 17339. I. G. FARBENINDUSTRIE. Igelit für die weichgummi-industrie. (Igelit for the soft rubber industry.) (Enlargement print of part of microfilm 180-2) n.d. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an advertising pamphlet and describes the physical and chemical characteristics and uses of Igelit, a trade-name for a polyvinylchloride plastic, useful as a rubber substitute. Plasticizers for various uses are given.

PB 17328. I. G. FARBENINDUSTRIE. Lupamid B. (Enlargement print of part of microfilm 180-1) n. d. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This report is a factory publication on a newly developed plastic. This material is supplied in form of pieces or grain. Its specific gravity is 1.1 g/cm³; it has a light color, is resistant to light and is difficultly flammable. It is resistant to neutral organic solvents and hydrocarbon but dissolves in concentrated organic and inorganic acids, in phenol and hot formamide; and is resistant to lkalis; it may be colored by water-colors. Lupamid B melts at 210-215°C. It can be formed by extrusion or in presses, but it cannot be rolled. It absorbs up to 6% water at 50°C.

PB 17642. I. G. FARBENINDUSTRIE. Verfahren zum verkleben von künstlichem kautschuk. (Method for gluing synthetic croutchovo.) (Enlargement print of part of microfilm 185-1) May 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a draft for a patent-application for a method of cementing synthetic rubber. This method is the cementing of mixed polymers from butadiene hydro-carbon and vinyl-methyl-ketone and under certain conditions other polymerizable materials with cements based on cellulose ester solutions. In German.

PB 16286. KOCH, W. E. Physical properties of Columbia resin plastics. (AAF. Eng. Div., Memo Rept. ENG -M - 56 -4120, Add. II) Mar 1943. 2 p. Price Microfilm-50¢ - Photostat-$1.00
Tests of physical properties of Columbia Resin 39A in 1/8 inch and ¼ inch cast form transparent sheet. Specimens exposed in Florida for 4 months were approved. Approval was based on change in parallel light transmission due to the exposure being only 91.0 to 90.0%. It is approved for use in airplanes in which its abrasion resistance and heat deformation resistance are essential, and its lack of formability does not offset its advantages over material conforming to U. S. Army Specification 94-12014B.

PB 9644. MURRAY, R. L. I. G. Farbenindustrie A. G. -Kalle A. G. Miscellaneous Chemicals, Wiesbaden-Biebrich, Germany. (CWS Intelligence Division Rept No. 3968) n. d. 2 p. Price: Microfilm-50¢ - Photostat-$1.00

This is a report of the condition and products manufactured at the plant, apparently a subsidiary of I. G. The plant was visited in May 1945 and Dr. Maus and Dr. Schmidt were interviewed. The products were mainly of the cellulose acetate variety.

PB 16284. SILVERSTEIN, A. Thermal expansion of plastics. (AAF Expt Eng Sect EXP-M-56-4020) Sept 1942. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Various types of plastics and plastic impregnated materials were tested for thermal expansion by means of the Lutz Dilatometer. The method of measurement, description of apparatus, calibration procedure and test procedure are given in appendix 1. Data for more than 50 samples were obtained over 3 temperature range ranges: 25°C to 0° C; 0° C to 50° C; and 50° C to 70° C. Mean thermal expansion coefficients for the range - 25° C to 70° C are given in appendix 2. The operation of the apparatus used is explained and a photograph illustrates it.

PB 10129. TURNDAHL, H. T. Vinyl aluminum engine envelope windows, Jan. 5, 1946. (AAF ATSC Eng Div EST-6-133) 1946. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
A window material developed by the Dow Chemical Company was tested and proved to have better aging characteristics than Saran or Pliofilm and did not tend to become opaque with age. This material is identified with the number Q270.3 and is a lamination of Saran and ethyl cellulose plastic materials.

PB 17639. VERKAUFSGESELLSCHAFT FÜR KUNSTSTOFF-ERZEUGNISSE m.b.H., Frankfurt (Main). Auskleiden von behältern mit Oppanol-folien. (Lining of containers with Oppanol sheets.) (Enlargement of part of microfilm 185-3) n. d. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The print contains general instructions with regard to use of different cements for Oppanol-sheets and the preparation of the areas to be lined. In German.

PB 17338. VERKAUFSGESELLSCHAFT FÜR KUNSTSTOFF-ERZEUGNISSE. Oppanol folien. (Oppanol sheets). (Enlargement of part of microfilm 180-2) n.d. 6 p. Price: Microfilm - 50¢ - Photostat - $1.00
This is an illustrated pamphlet which shows the use of Oppanol sheet in waterproofing and also for lining of containers and pipes to make them corrosion resistant. In German.

## Paints, Varnishes and Lacquers

PB 5601. BAKELITE CORPORATION. Coatings for wood ship bottoms. (OSRD Rept 4044). Aug 1944. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
In this progress report a number of paints and paint formulas, for use on wood ship bottoms, are discussed. Exceptionally good results have been obtained, both as to fouling resistance and to film integrity and erosion resistance, from several Vinylite-rosin combinations highly pigmented with metallic copper flake or with cuprous oxide or cuprous oxide-mercuric oxide. The composition and performance of these materials are summarized in Table I. The AF-14 formulation shown in this table has been tested on a number of small boats at the Beach Boat Slips, Miami Beach, Florida, and has given excellent results. It is quite likely the panel tests which were to be continued and the performance tests which were still under way would add further to the conviction that this type of coating is outstanding in its durability and resistance to fouling and other forms of attack. The spraying of metallic copper directly onto wood is also discussed in this report.

PB 16287. JUKKOLA, E. E. Camouflage finishes on stainless steel. (AAF Eng Div Memo Rept ENG-56-4148, Add. 1) Jan 1944. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Report on results of durability tests of camouflage finishes on stainless steel sheet. Panels were treated and finished with camouflage paints; then subjected to 6 months weather exposure at Miami, Florida. Results, which are given in the appendix, indicate that the standard camouflage finishes are satisfactory to use on stainless steel surfaces.

PB 16292. JUKKOLA, E. E. Hydrocarbon resistance of paint materials; effect of drying time. (AAF Eng Div ENG-M-56-4537) Sep 1943. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Test to determine effect of drying time on the resistance of camouflage lacquer and enamel finishes to aviation fuels containing aromatic hydrocarbons. Five days of air drying, or baking at 150° F. for 16 to 20 hours is recommended to attain hydrocarbon resistance of primer plus camouflage lacquer or enamel finish. Tables give the composition of aromatic test fluids and the effect of drying time and treatment of the surface on the resistance of camouflage lacquers.

PB 17641. I. G. FARBENINDUSTRIE. Verfahren zur herstellung von ölartigen trocknenden lackbindemitteln. (Procedure for the production of drying-oil-like lacquer vehicles.) (Enlargement of part of microfilm 185-1) Oct 1941. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a draft for a patent-application, referring to the treatment with oxygen or oxygen-containing gases of solutions of liquid polmerization products which are obtained by the polymerization of butadiene or its homologues with alkali metals to produce drying oil-like lacquer vehicles. In German.

PB 16778. ROSENWALD, ERICH. Inflammability of deicing fluid. (AAF ENG DIV. ENG - M - 56 - 4263) Mar 1943. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
Inflammability characteristics of isopropyl alcohol de-icing fluid at various temperatures and pressures showed that it would be classed in the inflammable range, as 70% water had to be added to reduce its combustibility to a safe minimum and that reduced its value as a de-icing fluid. Carbon dioxide under pressure added as an inert blanketing gas did not appreciably affect the inflammability when firing tests were made. Test procedures and results are given.

## Inorganic Chemicals

PB 5070. GETZ, CHARLES A. Carbon dioxide manufacture: AGKKo Kohlensaure Werke, Leipzig, Germany. (CIOS Rept) Jun 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The object of this visit was to learn if this plant had any new processes for manufacture. The report simply states the "process is conventional: burning coke in hand fired boilers, scrubbing and absorbing with potash solution, liberating, compressing and cooling to liquid".

PB 6368. HARTMAN, P. A. and others. Manufacture of white soda lime. A review of the literature. June 4, 1936. (KATR 223) June 1936. 31 p. Price: Microfilm-50¢ - Photostat-$3.00
This report presents a brief review of the literature describing methods of manufacture and composition of white soda lime granules for use in gas mask canisters. A bibliography is attached in which are listed papers giving information on various items related to soda lime and its manufacture. Tables and a flow sheet are included.

PB 18298. I. G. FARBENINDUSTRIE. Trockeneis (Kohlensäure fest). (Dry ice, solid carbon dioxid). (Enlargement print of part of microfilm 185-2) n. d. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This report consists of several advertising circulars illustrating various applications of solid carbon dioxide (dry ice).

PB 13827. KAISER WILHELM INSTITUT FÜR EISENFORSCHUNG, DÜSSELDORF. Verfahren zur erzeugung von eisenpulver für die herstellung von sintermetall. (Preparation of iron powder for sintering). (ALSOS Mission, Hoyt File 282) Jan 1941. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This report is a German patent application for a method of preparing iron powder direct out of pulverized enriched iron ores by reduction at temperatures between 600°C and 750°C, the grain size of the iron being predetermined by and the same as the size of grains of the pulverized ore.

PB 13819. LUYKEN, W. and KIRSCHBERG, H. Zur herstellung von eisenpulver für sinterkörper aus reinsten eisenerzkonzentraten. (Preparation of powdered iron for sintering from pure ores) (ALSOS Mission, Hoyt File 226) May 1945. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This paper describes pulverization and reduction methods used with the purest iron ores to get iron powder for metallo-ceramic purposes.

PB 16838. NEUMANN, HANS R. The production of fluorine (U-STOFF) and chlorine trifluoride (N-STOFF) 20-22 August 1945. (U. S. War Department. Intelligence Division Rept 4134) Aug 1945. 96 p. Price: Microfilm-$1.00 - Photostat-$7.00
This report is the result of the author's investigation of the German fluorine and chlorine trifluoride plant at Falkenhagen and is based on information received from its technical managers. It contains a full description of the working procedures for both chemicals, apparatus used, physical properties and possible uses. N-Stoff is a highly active incendiary. Attached is a collection of plans of the plant, machinery and apparatus. Some of the drawings may not reproduce well.

PB 6331. SCHLESINGER, H. I. Final Report to the Signal Corps Ground Signal Agency on Contract W. 3434-sc-174. 1943-1944. 75 p. Price: Microfilm-$1.00 - Photostat-$5.00
The original contract specified investigation of procedures for manufacturing sodium or other borohydrides. This report gathers together the information presented from time to time in the progress reports hitherto submitted, and gives some additional unreported data. In cases in which the original information was scattered through several progress reports, it has been recast into a unified statement; in other instances this report is an outline of the progress reports. References to the latter are made in all cases. Details of experimental procedures, and other matters indirectly related to the solution of the problem assigned are contained in a series of appendices. The report is preceded by a table of contents.

## Ordnance Chemicals

PB 5576. BARTLETT, PAUL D. Report on "The production of lewisite by the mercuric chloride process: Investigation of the effects of impurities in arsenic trichloride". (OSRD Rept 1075) Dec 1942. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
The purpose of this report is to determine to what extent arsenic trichloride prepared from low grade ores might be utilized without disadvantage in the production of M-1 by the mercuric chloride process. Results of the experiments are shown in three tables and one graph, and indicate that the addition of $SbCl_3$, $FeCl_3$, and $AlCl_3$ caused no changes in the rate of acetylene absorption or in the relative quantities of M-1, M-2, and vinyl chloride produced. The presence of 1% $PCl_3$ by weight in the arsenic trichloride gave rise to about 10% lower absorption rate without affecting the quantities of M-1, M-2 and vinyl chloride formed.

PB 5912. BERGMANN, MAX and others. Chemical reactions of divinyl sulfone, H sulfone and divinyl sulfoxide: Progress report to Dec 1, 1944. (OSRD Rept 4546) Jan 1945. 72 p. Price: Microfilm-$1.00 - Photostat-$5.00
This is a report under contract with the Rockefeller Institute for Medical Research. It appears that H sulfone (mustard gas sulfone) is transformed in vivo to divinyl sulfone and that the active vesicant is divinyl sulfone. Therefore most of the experiments are concerned with the chemical reactions of divinyl sulfone. The report lists reactions of divinyl sulfone with various compounds, such as sulfhydryl groups, pyridine, thiosulfate, nicotinamide, nicotinic acid, strychine, etc. Reactions of mustard gas sulfone and divinyl sulfide with some of the same compounds are also listed.

PB 5899. BERGMANN, MAX, and others. Chemical reactions of semi-H and H to December 15, 1944. (OSRD Report 4536) 1944. 25 p. Price: Microfilm-50¢ - Photostat-$2.00
This is a progress report under contract with the Rockefeller Institute for Medical Research. The experiments outlined were undertaken as part of a general investigation of the fundamental chemistry of the vesicant war gases, and have been reported previously in Informal Monthly Progress Reports of Division 9:5:1 from March, 1943 to March, 1944. Report discusses the reactions of H chlorohydrin (semi-H-CH) in water, with thiosulfate, with the $\alpha$-amino groups of amino acids and peptides, with carboxyl groups, with pyridine and nicotinic acid amide, with thiodiglycol, and the formation of CH-TG sulfonium salt from the reactions of H in water. The following reactions of H are also discussed: The oxidation of H and H derivatives by peracids; the vesicant action of H sulfone; the formation of dithiane and pyruvic acid in the reaction of H with cysteine; the hydrolysis of H in aqueous ethyl cellosolve solution; the reaction of H with anhydrous thiodiglycol; the reaction of 2-mercapto-4-methylimidazole with H and $HN_2$. For each case procedure and results, sometimes tabulated, are given.

PB 15771. GILBERT, JAMES R. Comparative tests of U. S. Gypsum Company incendiary compositions. (CWS Tech Div Memo Rept 522) Jan 1943. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
This report records the results of experiments to determine the relative value of incendiary fillings submitted by the U. S. Gypsum Company as compared with the standard CWS fillings therm-8-2 and therm-640. Seven photographs show the actions of the bombs.

PB 16173. HARRIS, B. L. and others. Storage stability of HVV with and without nitrogen bases at 65° C in 55-gallon drums and in shell. (CWS Tech Div Memo Rept 1100) Jul 1945. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
The need was to find materials to increase the viscocities of vesicants so that large drops could be obtained when sprayed from airplanes. This report describes the testing of HVV (a field thickener for mustard gas consisting of distilled mustard gas and methyl methacrylate polymer) for stability. Satisfactory results were obtained.

PB 5597. KISTIAKOWSKY, G. B. Report on "Preparation of radio active lewisite". (OSRD 867) Aug 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
The method which has been developed for the preparation of lewisite in large quantity can be adapted readily to the preparation of the same substance on a micro-scale. The only difficulties which are encountered are concerned with the purification of the product. The method of preparation is described in this report.

PB 6538. SHERWOOD, T. K. and WILLIAMS, G. C. Progress report on "Evaporation of falling drops.", to Oct 17, 1941. (OSRD report 278) Dec 1941. 48 p. Price: Microfilm-50¢ - Photostat-$4.00
This report presents a correlation of vaporization and friction data on spheres, from which the rate of vaporization of falling drops may be calculated. Graphs show the calculated per cent vaporization of HS drops falling from heights up to 30,000 feet, HS being one of the mustard gases. Table, high-speed photographs and 49 references are given. This is a progress report under contract with Massachusetts Institute of Technology. Findings may be applied to liquids sprayed from aircraft.

PB 5892. SWIFT, E. H. and NIEMANN, CARL. A system for the ultimate analysis of chemical warfare agents: Part III;Progress Report to June 22, 1945. (OSRD Report No. 5430) Aug 1945. 122 p. Price: Microfilm-$1.50 - Photostat-$9.00

This is a report under contract with the California Institute of Technology. The procedures detailed in this report are part of a system of analysis for the acidic and basic elements in chemical warfare agents. Methods are detailed for the systematic detection and semiquantitative estimation of aluminum, antimony, arsenic, barium, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium,selenium, silver, strontium, tellurium, tin, titanium, and zinc. They are applicable to most organic compounds and to most inorganic compounds which are not resistant to fusion with sodium peroxide. A 10-20 mg. sample is needed for the analysis. A basic element can be detected if it comprises at least 1% of the sample. The acidic elements have been previously considered in parts I and II.

## Analytical Chemistry

PB 15609. LATIMER, W. M. and others. The hot wire analyser for gas concentrations: Progress rept to November 20, 1943. (OSRD Rept 3048) Dec 1943. 21 p. Price: Microfilm-50¢ - Photostat-$2.00

A description is given of a modification of the Davis Emergency Equipment Company detector which attains greater sensitivity for the determination of combustible gases. Amplifying circuits are given for use with the Esterline - Angus recording milliammeter. A simpler and more sensitive recording millivoltmeter, photoelectric, eliminates the amplifiers used with the Esterline - Angus recorders. The recorders have been employed for work on contract with butane, and calibration curves for both instruments are given. The recorder also registers concentrations of AC (hydrocyanic acid), CG (phosgene) and CC (cyanogen chloride), and calibration curves for the latter two are shown. Diagrams are included. This is a progress report under contract with the University of California.

PB 5484. MASON, C. W. and DE LA MATER, G. B. Microscopical properties of derivatives of fluorine agents. (OSRD report 4716) Feb 1945. 15 p. Price: Microfilm-50¢ - Photostat-$1.00

Progress report under contract with Cornell University. The microscopical properties of the b-fluoroethyl - 3, 5 - dinitrobenzoate and the b-fluoroethyl - N -(naphthyl) carbamate, derivatives of 2-fluoroethanol and fluoroacetophenylhydrazide, a derivative of methyl fluoroacetate are detailed, illustrated and described. Diagrams.

PB 16872. MURRAY, K. The chemical analysis of tool tips containing carbides of tungsten, columbium, tantalum and titanium bonded in a cobalt matrix. (Watertown Arsenal Lab Memo Rept WAL 120/42) Feb 1946. 15 p. Price: Microfilm-50¢ - Photostat-$1.00

This report describes the methods used in the Chemical Section of the Laboratory at Watertown Arsenal for the analysis of tool tips containing carbides of tungsten, columbium, tantalum and titanium bonded in a cobalt matrix. A procedure which yielded satisfactory analytical results with a reasonable expenditure of time is described in sufficient detail to permit its use by experienced analysts. Methods of analysis which were tried and found unsatisfactory are outlined briefly. The method described in this report for opening of samples proved adequate for materials which in some cases were relatively coarse (80 mesh). Typical compositions of the carbide types analyzed are given in the report.

PB 5914. NORTHROP, JOHN H. and GETTEMANS, J. F. Automatic titrator for the determination of H, L and other gases in air; Supplement No. 4; Progress Report to Sept 5, 1944. (OSRD Rept No. 4310) Oct 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00

This is a progress report under contract with the Rockefeller Institute for Medical Research. It describes the determination of $HN_3$ with sodium hydroxide after decomposition. $HN_3$ (tris (B chloroethyl) amine) is decomposed on passing over platinized asbestos at white heat. 3 mols HCl are liberated and absorbed in M/10 NaCl. The acid is then titrated potentiometrically with $10^{-3}$ or $10^{-4}$ N NaOH. This method is considered superior to the titration with silver nitrate. H is mustard gas, and L is Lewisite.

PB 4509. ROSE, EUGENE L. and WEAVER, A. B. German training matches. (CWS Foreign Material Tech Rept 93) Sept 1944. 7 p. Price: Microfilm-50¢ - Photostat-$1.00

Three boxes of German training matches to train troops to detect dangerous gases were tested. They contained Adamsite (diphenyl chlorarsine), Clark II (diphenyl cyanarsine), and chloracetophenone. This equipment is not comparable to U. S. items, but it is felt that our sniff method from glass bottles is superior. Photographs of the boxes are included.

## Miscellaneous Chemicals

PB 11579. BUSWELL, A. M. and others. Instructions for operating kit, water testing, poison, treatment control. (CWS Field Lab Memo 1-3-21) Jun 1944. 22 p. Price: Microfilm-50¢ - Photostat-$2.00

The purpose of this report is to provide instructions for using the kit, (Medical Department item no. 99307) for carrying out quantitative determination of "mustards", "arsenicals" (Lewisite), pH and "chlorine demand." These four determinations serve to indicate whether it is feasible to treat a water contaminated with the above, and the dosage of chemicals to be used if treatment is to be applied. These same tests must be applied to determine whether or not the water has been treated satisfactorily. Instructions are also given for making specific qualitative tests for cyanide, lead, thallium mercury and selenium. Photographs.

PB 5078. CURTIS, HARRY A. Items selected from the minutes of the meetings of the I. G. Technische Ausschuss. (CIOS File XXXII, item 124) Jul 1945. 7 p. Price: Microfilm-50¢ - Photostat-$1.00

The items were selected and translated by Harry A. Curtis. These were the more important technical notes of Tea (Technische Ausschuss of the I. G. Farbenindustrie). A report by Reppe is mentioned dusscussing the butadiene synthesis from 2 molecules of formaldehyde and 1 molecule of acetylene. A method of recovering zinc from the products of copper smelters is given, using a zinc amalgam electrolytic process. The zinc produced is 99.999% pure and may have a low cost of production. Mersol as a fat substitute for soaps is touched upon. Also considered are the polyurethane reaction, new developments of di-isocyanate chemistry and further reports by Reppe of advances in acetylene and carbon monoxide chemistry.

PB 16095. KLICKSON, B. T. Some properties of infrared sensitive phosphors. n. d. 1 p. Price: Microfilm-50¢ - Photostat-$1.00

A very brief report stating that work was done by Urbach, Ward, Pond and others upon a group of phosphors, which show a large increase of phosphorescence after irradiation by infra red. Some properties of alkaline earth sulfide and selenide phosphors are described in the reports by those men.

PB 18941. GREAVES, C. Scholler wood sugar plant at Holzminden. (BIOS Final Rept 176, Item 22) Nov 1945. 17 p. Price: Microfilm-50¢ - Photostat-$2.00

Ordinarily the plant operates on wood and uses 1750 metric tons (calculated on the oven dry basis) per month of sawdust and shavings of coniferous woods from which there can be obtained either 300,000 liters of alcohol, or 250 tons of dry yeast. The species used are mostly pine, spruce and fir. Up to 1943 the plant produced only ethyl alcohol. In 1944

it produced 1,500,000 liters of alcohol and 237,000 kg of dry food yeast. The following brief outline of the process as carried out at Holzminden is presented. Wood is charged in a finely divided state into a tall cylindrical vessel called a percolator. Hot dilute sulphuric acid is forced down through the wood under steam pressure. By this means, a portion of the cellulose is converted to sugars, which are in solution in the liquid drawn off from the bottom of the percolator. Fresh acid is now forced through the wood remaining in the percolator, and this is repeated 19 or 20 times. The final result is that all of the cellulose content of the wood is converted to sugars which are drawn off in solution, and the lignin remains in the percolator. The sugars in solutions are converted into alcohol by growing yeast under such conditions that the yeast converts the fermentable sugars to alcohol, or the conditions of yeast growth may be so regulated that the yeast cells increase tremendously, using the sugars as food, and no alcohol results but only an increase in the quantity of yeast. Instructions for carrying out a percolation are shown in a table included in the report. Detailed descriptions of plant equipment and process, as well as data concerning the factory at Holzminden are given. Sketch of centrifuges is also presented.

PB 18293. I. G. FARBENINDUSTRIE. Verfahren zur gewinnung von acetylen aus kohlenwasserstoffen in elektrischen lichtbogen. (Preparation of acetylene from hydrocarbons in an electric arc.) (Enlargement print of part of microfilm 185-1) Nov 1941. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a draft of a German patent application. The appendix gives a cut of the electric arc burner with hollow electrodes by means of which 1 kg of acetylene and homologues was produced out of 2 kg of hydrocarbons of the methane series with 8.5 kwh of electric energy. For best results the ratio of voltage to current should be between 10 and 0.5, preferably between 5 and 1. In German.

PB 15568. JAIME, von O. and others. Getreidestroh als rohstoff zur herstellung von papier und kunstfaserzellstoffen (Straw as raw material for the manufacture of paper and synthetic fibers). (FIAT Rept 56, Supp) Dec 1940. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
This report, Supplementing PB 1130, this Bibliography p. 76, contains individual articles on the chemical composition of straw, the morphology of straw fiber, the manufacture of paper pulp, treatment of straw cellulose by acids, one- and two-step methods of manufacturing straw cellulose low in pentosan, and the manufacture of low pentosan cellulose in which furfurol is produced as by-product cellulose-manufacture.

PB 14502. MILLER, C. K. Preparation and properties of bis-(2-chloroethyl) selenide. (CWS. T.D.M.R. 646) May 1943. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a report of the preparation of bis-(2-chloroethyl) selenide, also known as selenium mustard, by the action of ethylene on selenium tetrachloride followed by reduction with hydrogen chloride. The physical properties of this compound as determined at Edgewood Arsenal are given.

PB 15749. MUNRO, WENDELL P. Colored smokes; oxidizing agents to replace potassium chlorate. (CWS. T.D. M.R. 577) Feb 1943. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
The above memorandum reports the results of investigation to determine whether other oxidizing agents, particularly potassium nitrate, could be used in the fuel mix instead of potassium chlorate. Conclusions are: 1. potassium nitrate can be used in producing red smokes in the M1b grenade (slow burning) and the 105mm base ejection canister and 2. nitrate fuels are unsatisfactory in the 75 mm base emission shell and with auramine (yellow) and indigo (blue) dyes nitrate fuels.

PB 18934. PAYAN, C. F. The manufacture of artificial leather tanning agents from waste sulphite liquor at Zellstoffabrik Waldhof, Mannheim-Waldhof. (BIOS Final Rept 187, Item 22) n.d. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This mill makes sulphite wood pulp from beech and spruce, about 10 percent of the waste sulphite liquor being used to make leather tanning liquors. Only the waste liquor from spruce pulp is used for this purpose. After the digestion of the spruce wood chips with calcium sulphite, the digest is allowed to cool, and the liquor separated from the pulp through gravity flow filters in the tank. The sulphite liquor is then neutralized with liquid ammonia. Insoluble calcium salts which form, are allowed to settle, and the cleared liquor drawn off and concentrated to 60 percent dry substance. After adjusting the pH to 5.5 with lime, the concentrated liquid is subjected to a fermentation process whereby the sugars present are converted to alcohol which is subsequently removed. The final step is a treatment with sulphuric acid: 5000 kilo of liquor (50 percent D.S.) is treated with 600 kilo of 25 percent sulphuric acid (or 150 kilo of 96 percent acid) at 80°C. The calcium precipitates as sulphate which is filtered out at 60° to 70° by a vacuum filter. The liquor obtained in this manner is known as HANSA "D". HANSA "N" is prepared in a similar manner to HANSA "D" except that sodium sulphate is used instead of sulphuric acid to precipitate out the calcium salts. Process of manufacturing G.M., a mixture of HANSA "D" with a phenol-formaldehyde resin, is also given. These products have found a definite place in the German leather industry and have been used to good advantage to supplement and to improve blendings of the natural tannins.

PB 18435. PIEPER, GUSTAV. Über die autoxydation des benzaldehyds und des dibiphenylenäthylens. (On the autoxidation of the benzaldehyde and the dibiphenylene-ethylene) (ALSOS Mission, RFR 713) 1940. 56 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report is a doctor's thesis. The distribution of oxygen in auto-oxidizing benzaldehyde in its oxidation products, with or without the addition of dibiphenylene-ethylene was measured. The Mol Adduct Theory of Wittig and Krönne as a mechanism for the auto-oxidation of benzaldehyde was discussed and received support by the measurement of the temperature coefficients and influence of the solvent. A reaction mechanism for the oxidation of the dibiphenylene-ethylene in auto-oxidizing benzaldehyde was derived from the experimental results. It was shown that the oxidation of dibiphenylene-ethylene in ether and in unsaturated hydrocarbons proceeds and depends upon the oxidizability of the solvents. The investigation of peroxide mixtures resulting from the auto-oxidation led to the preparation of the fluorenone-peroxide monomers, whose properties are described. A description of the experimental work, diagrams, tables and bibliography are included.

PB 13366. REPPE. Advances in acetylene chemistry. (Off of Rubber Reserve Rept G 1) Jul 1945. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
This report is a translation of a captured German report, giving an address by the director of the I.G. Farben plant at Ludwigshafen on the occasion of the first meeting of the Technical Society in Harnack House, Berlin, July 1940. The author discusses new techniques in the handling of acetylene to prepare vinyl compounds. The vinyl reaction with few exceptions is applicable to all organic compounds with hydroxyl groups. In effect acetylene can be used to convert most organic substances into polymerizable compounds. A substance like vinyl methyl ether can be broken down into acetaldehyde and methanol, which would be a useful way of preparing acetaldehyde without using mercury. The vinyl process is important in Germany because there is no lack of acetylene in Germany. Vinyl polymers have already found many uses in Germany.

PB 15803. SCHULTHEIS and SCHIMMELSCHMIDT. Protokoll und erginzungen über die bei der vernehmung der Herren Dr. Schultheis und Dr. Schimmelschmidt am 30 April 1945 in Höchst behandelten punkte. (Minutes and supplemental remarks on matters discussed in the interrogation of Dr. Schultheis and Dr. Schimmelschmidt at Höchst on 30 April 1945) 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00

This report is a statement signed by the two above named individuals regarding 1. Infra-red research and 2. collaboration with Peenemünde. These men stated they knew nothing regarding the former, but that all reports and journals dealing with work done at Höchst in the fields of sensitizers, filters and photographic dyes are available. As for item 2, after a meeting with representatives from Peenemünde research was started on reducing corrosion caused by nitric acid, and a substitute for nitric acid as an oxygen carrier (primarily tetranitromethane), for use as rocket fuels. 10 tons of tetranitromethane were ordered for research purposes. It was abandoned, however, because combustion temperature was too high (3000°C) for any known materials to be used with it. Production of tetranitromethane was developed from acetic anhydride and nitric acid. About 10 tons were actually produced and the apparatus is still in existence and undamaged. A method based on acetylene was also worked out to a production of 10 kg per day. A few brief remarks were also made regarding corrosion resistance, specialty oil substitutes, and fire extinguishers. See also PB 15476.

PB 11856. WARD, FREDERICK H. and others. The effect of soil moisture on liberation of H. (T.R.L.E. 31.) May 1944. 22 p. Price: Microfilm-50¢ - Photostat-$2.00

A report of experiments undertaken on five representative soil types to determine what effect, if any, soil moisture would have on the rates of liberation of H. (mustard gas). Conclusions are 1. that soils at the lower moisture levels show a higher degree of retention of mustard gas and 2. sand yields a higher percentage of H at moisture contents slightly above the experimental moisture equivalent. Graphs.

PB 16093. WARD, ROLAND. Preparation and properties of infra-red sensitive strontium selenide and sulfide-selenide phosphors. n. d. 2 p. Price: Microfilm-50¢ - Photostat-$1.00

This is a very brief report on phosphorescence of materials stimulated by exposure to infra-red radiation.

## DETERIORATION STUDIES (INCLUDING TROPICAL DETERIORATION)

PB 16222. GIESEMAN, E. R. Fungus growth of aircraft cable. (AAF ATSC Memo Rept ENG 54-656-964) Feb 1944. 5 p. Price: Microfilm-50¢ - Photostat-$1.00

Conference held at Bureau of Plant Industry in connection with fungus growth on aircraft primary cable. Tests were made of braids with vinylite insulation; with cotton braid, with and without fungicide; glass braid, cellulose acetate rayon braid, with and without fungicide. Formulas are given for saturant and cable lacquer without fungicide and with 2% Dowicide 7. Method of test is described. Glass braid was resistant to fungus growth, cotton and rayon were not resistant unless a fungicide is applied in the braid saturant or sizing and to the cellulose acetate lacquer. Plans were made to revise Specification AN-J-C-48 to incorporate a fungus growth resistance with same.

PB 18463. LEUTRITZ, JOHN, JR. Mold and mildew resistance of coating materials. (NDRC Rept Misc 3. Tropical Deterioration Administrative Committee Rept TDIC 66) Aug 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00

This report is concerned with the procedure to be followed in developing an assay of the fungicidal properties of coating materials used on assembled communications and associated electrical equipment. Selection of fungi, environmental conditions and relationship between substrate and toxicity are discussed and tentative test procedure is outlined.

PB 12004. LUCE, R. H. and STOKER, W. C. Fungus growth on hookup wire. Interim report. August 1945. (Tropical Deterioration Administrative Committee Rept 13). Aug 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00

This report describes a method of obtaining electrical measurements (surface and volume resistance) of wires. The wire samples were dry dusted with a mixture of spores and then sealed in battery jars at 100% RH plus dew. Temperature was variable measurements were made over a period of 15 days. The jars were then opened and measurements made of the extent and the rate of recovery. Results of the tests are given. Diagrams of guarded circuits for machine equipment, the volume and surface resistance, and tables are included.

PB 12044. U. S. NATIONAL DEFENSE RESEARCH COMMITTEE. United States specifications incorporating fungus test methods. (Tropical Deterioration Information Center Rept 52). Jun 1945. 21 p. Price: Microfilm-50¢ - Photostat-$2.00

This is a revision of the report with the same title issued in April 1945. (See PB 12040). The data are arranged in tabular form under the headings; Agency, Symbol, Date, Status, and Title, (of specifications), Microorganisms required, Pre-treatment of sample, Nutrient medium required, Incubation, and Means of recording results. The specifications are arranged by type of material; - cordage-fiber, cork, electrical equipment, leather, paint, plastics, textiles and miscellaneous. (See also PB 12049).

PB 18464. U. S. NATIONAL DEFENSE RESEARCH COMMITTEE. TROPICAL DETERIORATION ADMINISTRATIVE COMMITTEE. Status of Equipment and Materials Branch projects as of 31 August 1944. (NDRC Misc Rept 10. TDIC-70) Sept 1944. 16 p. Price: Microfilm-50¢ - Photostat-$2.00

This report consists of a summary of the status of various projects received from Navy Department. The following subjects are covered: Use of self sealing hose; cylindrical steel shipping containers for aircraft engines; protective lacquer for internal steel surfaces of aircraft engine assemblies; liquid oxygen development; droppable rescue assembly; corrosion protection; and hydraulic hose.

PB 12007. UNIVERSITY OF PENNSYLVANIA. Fungus fouling of optical instruments: Sealing compounds. Interim report. (Tropical Deterioration Administrative Committee Report 87). Apr 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00

Report on activities in connection with contract OEMsr-205 at the University of Pennsylvania, April 1945. Of the sealing compounds thus far tested, it was reported that the combinations of Darex Thermoplast #XEP-412 with Darex Thermoplast #XEP-378 or, with Microcrystalline Wax #2310 (Socony Vacuum Company), known as C-6, showed the greatest promise. The fourth sheet of this report contains formulations for five new sealing compounds, the properties of which indicated that they were worth further investigation. Results of tests of binoculars treated with specified fungicides and subjected to tropical exposure at the Barro Colorado Island test station in Panama, are given in tabular form.

PB 11997. WELLMAN, R. H. and MCCALLAN, S. E. A. Deterioration of plastics by microbial action: Monthly report, Oct. 1 to Oct. 31, 1944. (Tropical Deterioration Administrative Committee Rept 45) 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00

During this month tests were made on asphalt, "Dulux" and aluminum paints, on 26 different Bakelite based materials and on three vinyl plastics to determine their resistance to fungus growth. In these tests the samples were inoculated with three different fungi, and also were subjected to the soil burial test. The results are given in tabular form.

PB 11999. WELLMAN, R. H. and MCCALLAN, S. E. A. Deterioration of plastics by microbial action. Monthly report, Dec. 1 to Dec. 31, 1944. (Tropical Deterioration Administrative Committee Rept 47) Dec 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00

This progress report for December 1944 gives further data on a series of tests of fungus growth on vinyl plastics.

The results given in Table 1 show the degree of fungus attack on the different components of Vinylite plastics after eight weeks' exposure. The results indicate that the unplasticised materials are in general inert to fungus attack. Plasticised materials vary widely in the degree to which they support fungus growth. The presence or absence of a lubricant makes a difference in the degree of attack on a plasticised Vinylite in regard to any specific fungus, but there seems no general consistency since one fungus will attack one lubricant while another works on a different one. Table 2 shows the initial results of tests to determine fungus deterioration of a series of Bakelite samples after two weeks' exposure.

PB 11960. WELLMAN, R. H. and McCALLAN, S. E. A. Fungus resistance of plastics. (OSRD Rept 5683. Tropical Deterioration Administrative Committee Rept 18). Sep 1945. 69 p. Price: Microfilm-$1.00 - Photostat-$5.00

This report prepared by Bakelite Corporation under contract with NDRC, is divided into two sections: Part I, plastics, components, and fungicides. The plastic samples and components were inoculated with various "tropical" fungi and exposed in a "tropical room" using the following methods: "Mineral agar base", "Plastic only - moist chamber", "Plastic only - free hanging", and "Soil Burial", with the following results: Vinyl resins, wholly synthetic phthalate and phosphate plasticizers, inorganic pigments and fillers do not support fungus growth. Phenol-formaldehyde resins are not subject to fungus attack. Phenol-formaldehyde or Vinyl type adhesives, "Haloweax", "Nylon", and "Vinyon -N" are resistant to fungus attack. Phenol-formaldehyde plastics containing cellulosic fillers are not particularly susceptible if the particles are finely divided and each coated with resin. Cotton ducks and wood flours vary in their susceptibility to attack. Plasticizers, laminates or lubricants based on products of animal or vegetable origin are susceptible to fungus attack. Copper naphthenates protect cotton, ducks from fungus attack in soil burial experiments. But "Cuprenate OH", copper pentachlorophenate, copper-hydroxyquinoline, dihydroxy diphenyl methane, salicylanilide, and zinc diethyl dithiocarbamate are more effective. The impregnation of cotton duck base with fungicides does not materially increase the resistance of phenol-formaldehyde laminates to fungus attack, but the incorporation of 2% by weight of standard fungicides in the mix of a susceptible vinyl type plastic improved the resistance. A high quality, moisture proof varnish is as good a fungicidal finish for phenol-formaldehyde cotton base laminate as any of the fungicidal finishes tried. Part II, Biological Factors: A study was made of various biological factors influencing the growth of fungi on plastics. Some 32 different cultures representing 20 species of fungi were used. Three representative plastics were chosen: "Vinylite VU 1900", Vinylite VU 5904", and the phenol-formaldehyde cloth base laminate "Lamicoid 6030". One-inch squares of the plastics on standard mineral salts agar in Petri dishes were inoculated. The extent of growth ranging from none to very heavy was given the numerical ratings of 0, 1, 4, 10 and 20. Over 3000 petri dish culture observations were made. Inoculation was by atomization under a hood. The amount of growth is dependent on the spore suspension inoculum up to about 2000 spores per square inch of plastic surface. The growth of contaminants is reduced as the amount of inoculum is increased. Spore concentration of culture inoculations should be standardized, a minimum of 1000 per square inch per fungus is suggested, while 100,000 to 1,000,000 would be preferred for reducing contaminant growth. Since a given fungus culture under standard conditions tends to produce the same quantity of spores, a constant dilution factor may be used in preparing the standard inoculum. Observations were made at 5, 10, 20 and 40 days after inoculation. Most contaminants reach their peak of development later than the inoculants. Comparisons were made of the growth of the different fungi in single culture on the plastics. In general, the greater the growth of inoculant, the less the growth of contaminants. The Aspergilli as a group, show more sustained growth. The fungi were rated in 5 classes, on their desirability for single culture organisms, on the relative amount of growth and freedom from contamination. Contaminating fungi were identified as far as feasible and their relative abundance noted. Several series of mixed cultures were studied. Marked differences were noted; most fungi behaved as in single culture but a few were unable to meet mixed culture competition. Charts and tables are included in the report.

PB 11965. WELLMAN, R. H. and McCALLAN, S. E. A. Fungus resistance of plastics: Interim report, June 1945. (Tropical Deterioration Administration Committee Rept 4) Jun 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00.

The results of experiments on certain plastics is given in tabular form as follows: Results of protective (fungicidal) finishes on phenol-formaldehyde cloth-base laminates, results of incorporating 5% of certain fungicides into "Bakelite" varnish XV-1657 and using the product to protect phenol-formaldehyde cloth base laminates from fungus attack; and fungus attack on free-hanging "Vinylite" plastic.

## ELECTRICAL MACHINERY, EQUIPMENT, AND SUPPLIES

### Communication Equipment

German

PB 21980. ODARENKO, T. M. Spectographic monitoring equipment for radio stations. (JIOA Rept 58) Dec 1945. 11 p. Price: Microfilm - 50¢ - Photostat - $1.00

This report gives a brief description and discussion of a radio monitoring recorder devised and used by Hans Kerner, an employee of the Austrian Post and Telegraph Office. This device consists of a light source actuated by a radio receiver thru a triode, an optical system and a photo-sensitized film or paper. A driving mechanism controlled by a precision clock moves the light source, the recording film, and the tuning control of the receiver in such a manner that the film is scanned in time and in frequency. Since the light intensity can be made nearly proportional to the voltage output of the receiver, a relative indication of the strength of the received signals is obtained. A schematic drawing and copies of typical records obtained with this equipment are included but are not very legible.

PB 21978. ODARENKO, T. M. Synchronized broadcasting systems in Upper Austria: Principle of operation. (JIOA Rept 59) Dec 1945. 10 p. Price: Microfilm 50¢ - Photostat - $1.00

In this report an American investigator gives block diagrams and a general description of the three synchronized broadcasting systems in operation in Austria. The main transmitter and the secondary stations operate at the same frequency and are connected by cable or wire lines. All three systems use quartz-stages and phase bridges or phase-meters which aid in maintaining the proper phase relations in the system. Insulation and thermostatic control of the quartz-stage temperature resulted in a frequency constancy of $10^{-7}$.

PB 21979. ODARENKO, T. M. 12-channel long-distance voice-frequency telegraph system. (JIOA Rept 57) Dec 1945. 12 p. Price: Microfilm - 50¢ - Photostat - $1.00

A system for efficient use of existing Austrian telegraph lines is discussed by an American investigator. The system was proposed by Dr. I. K. Oettl, president of the Austrian Post and Telegraph Direction, and involves the use of lightly loaded (type b) lines with a cut-off frequency of about 5400 cycles, to carry 12 high-quality telegraph channels and one voice channel. Under this method Wehrmacht Tfb sets are used to move voice frequencies to the range of 2650 to about 4570 cps with a carrier of 4870 cps and the lower frequencies are used for the telegraph circuits. Slight changes would have to be made in the Tfb sets and some simple modifications would be required in the lines. A translation of the German report is appended together with a poor reproduction of the German original. Block diagrams and a schematic are included.

PB 8372. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Berührungsmikrophon, insbesonders kehlkopfmikrophon. (Contact microphone, especially laryax microphone.) German pat ent 738263, applied for March 11, 1939, with number T51931 VIIa/21a2. Original inventors - Bäcks and Pöhle. 1939. 15 p. Price: Microfilm - 50¢ - Photostat - $1.00

Japanese

PB 16089. NOBBS, MARVIN. Japanese FM radio relay equipment operating in the frequency range of 550-670 megacycles. Oct 1945. 24 p. Price: Microfilm-50¢ - Photostat-$2.00
This is an operations analysis report on what was supposedly the highest frequency radio communications equipment developed by the Japanese at the end of the war. It was planned to use this VHF radio system for telephonic communication within the optical range, i.e. 72 mile distances or less. A general description of the equipment is given and a brief study of the transmitter and receiver is recorded. Photographs and schematic diagrams illustrate the report.

United States

PB 16882. BOURLAND, L. T. and others. Report on test of Model M-527C radio receiver (manufactured by the Hallicrafters Co.). (Naval Res Lab Rept R-1840. BuShips Prob R3-b0) Jan 1942. 92 p. Price: Microfilm-$1.00 - Photostat-$7.00
This report describes and gives the results of a comprehensive series of more than 30 tests on the subject ultra high frequency receiver. Recommendations are made for improvement of the receiver for Navy needs. It was found in general, however, that the receiver met the stipulations of the manufacturers specifications and was a well-designed well-constructed set. Tests included investigation of electrical and mechanical characteristics as well as study of the operation of the set under varying conditions. The report includes many performance curves, photographs, and a schematic. The equipment has a frequency range of 130 to 210 mc covered in one band.

PB 16889. BOURLAND, L. T. and others. Test of Model RBQ radio receiving equipment. (Naval Res Lab Rept R-1738. BuShips Problem R3-7C) Jun 1941. 120 p.
Price: Microfilm-$1.50 - Photostat-$8.00
This equipment is composed of a receiver unit, an antenna control unit, antenna, and antenna transmission line. It was manufactured by the RCA Manufacturing Co. to meet specifications of the Navy Bureau of Engineering. A superheterodyne circuit is employed to receive voice or tone modulated signals in two bands covering the range 50 to 200 Mc. Tests, consisting of a general inspection of mechanical construction and wiring and a comprehensive electrical investigation, were conducted to determine the extent to which the unit met the specifications. It is found that specifications were met with certain noted exceptions. Specific changes which will bring the equipment wholly within the specifications are recommended as well as a number of other changes which conform to general Navy Practice. Tables and performance curves give the results of the various tests. Also included are photographs of equipment components and a schematic.

PB 16881. DAVIS, C. B. Test of Model TBL-5 radio transmitting equipment (manufactured by Westinghouse Electric and Mfg Co.) (Naval Res Lab Rept R-1836. BuShips Prob R3-33c) Jan 1942. 320 p. Price: Microfilm-$3.50 - Photostat-$21.00
The basic unit of the material under test is a transmitter unit which has a frequency range in two bands of 175 x 500 and 2,000 to 18,100 kc, a nominal rated output of 200 watts, and provides for CW, MCW, and voice operation in the LF band and CW and voice in the HF band. Other major components are a motor generator, motor starter, filter unit, speech input equipment, chest microphone assembly and two receiver input attenuators. The test was conducted to determine whether this model met its specifications and to obtain information for possible additions to future specifications. Many individual mechanical and performance tests were made and results recorded in the text. 128 tables and 57 graphs and photographs are included. The equipment was found to be generally well-constructed and satisfactory but certain corrective action is indicated.

PB 14408. HARVARD UNIVERSITY. RADIO RESEARCH LABORATORY. Instruction book for operation of radio transmitting and receiving equipment AN/ARC-8 (XA-2). (Rept 411-IB-6A) Feb 1944. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
ARC-8 is a radio transmitting and receiving equipment designed for aircraft installation. A common oscillator is used for transmitter and receiver, guaranteeing that transmission and reception are on the same frequency. Preliminary tuning adjustment make possible single dial remote control over limited portions of the entire frequency range of the equipment, by varying the common oscillator frequency. Very brief information is given on installation, adjustment, and the operation of the equipment along with a few notes on servicing. A drawing showing the location of principle components and a cabling diagram illustrate the manual.

PB 16902. MACGREGOR, J. J. and ZETTLE, E. W. Report on tests of Model XRAX patrol plane radio receiving equipment (manufactured by the General Electric Co). (Naval Res Lab Rept R-1709) Mar 1941. 111 p. Price: Microfilm-$1.50 - Photostat-$8.00
The equipment consists of a rack of 3 separate receiver units covering the range 200 - 27,000 Kc. The power supply is the plane's 24-volt storage battery. Receivers are of superheterodyne design, will receive CW, MCW, or voice, and may be operated singly or simultaneously. This report describes tests performed on an advance model, consisting of careful electrical and mechanical tests with a flight test report given as an appendix. It was found that construction and materials were good but a number of counts on which specifications were not met are given and recommendations are made for elimination of these defects. Numerous tables and graphs of test results are given and the report includes photographs of the equipment tested.

PB 17995. U. S. NAVY DEPARTMENT. Instruction book for model RBF radio receiving equipment for frequency modulated signals, frequency range: 60 to 100 megacycles. (Manufactured by The Hallicrafters Co. Chicago, Ill.). Feb 19, 1941. 41 p. Price: Microfilm-50¢ - Photostat-$3.00
The instruction book is concerned with the installation, adjustment and operation and alignment and service of the model RBF radio receiving equipment. This equipment consists of three removable units assembled in a single cabinet. The two lower units are ultra high frequency receivers model S-27A, covering the frequency range 60 to 100 megacycles, and equipped for receiving frequency modulated signals only. The upper units consists of a motor scanner which provides to the tuning mechanism of each receiver, and allows automatic scanning of any portion of the frequency spectrum covered by the receiver. Each receiver is a complete unit in itself, and each may be independently operated. There is a table of tube socket voltages, a list of replaceable parts, a spare parts list. Instructions relative to the CR9441-C2A and -C2B limit switches are appended to the instruction manual. This is a shaft-driven, geared-type of switch which is designed for direct connecting to the shaft of a motor or other driving member and for opening or closing contacts at the limits of travel in both directions. The instructions concerning the installation, operation and adjustment of this switch were provided by the General Electric Company. Diagrams and photographs illustrate the manual.

PB 17417. U. S. NAVY DEPARTMENT. Instruction book for Model TCA radio telephone transmitting equipment. (Manufactured by Collins Radio Co, Cedar Rapids, Ia.) Apr 1939. 40 p. Price: Microfilm-50¢ - Photostat-$3.00

The Navy type TCA transmitter is a complete 15-watt 4-channel radio-telephone transmitter designed for voice communication services requiring a rapid change of frequency. The unit is designed to operate on any one of four pre-selected frequencies in the range 3,000 to 10,000 kc by the manipulation of a single rotary-type switch. The audio frequency response and harmonic content are held to such values as will give high quality transmission for the service for which the transmitter is designed. Manual contains instructions for installation, adjustment and maintenance. Parts lists, photographs, tube data, and drawings are included.

PB 14783. U. S. NAVY DEPARTMENT. BUREAU OF AERONAUTICS. Handbook of maintenance instructions for model AN/ARC-1 aircraft radio. Revised April 1, 1945. (AN 16-30 ARC1-3). 1945. 232 p. Price: Microfilm-$2.50 - Photostat-$16.00
This handbook describes the Model AN/ARC-1 aircraft radio equipment and includes information concerning the installation, adjustment, operation, and maintenance of the equipment. There is also given in this handbook information showing the differences between early and late production equipments. Revisions in the text are indicated by a heavy black line placed in the left-hand margin opposite the change. This line is opposite the change. This line is omitted where more than 50 per cent of the page is revised. Drawing changes are indicated by numbered arrows, the number referring to a note on the drawing. In addition, there is given in Section VI, Supplementary Data, a summary of the changes in the equipment. The equipment operates from a 24-volt battery supply and provides radio telephone communication in the frequency range of 100-156 megacycles between aircraft or between aircraft and ground stations. Provision is made for the remote selection of a two-way operating frequency which may be any one of nine preset frequencies in the band or a guard-channel frequency which is fixed and within a restricted band covered by the specification for this equipment. Sixty-eight illustrations are given of the various components, including functional and schematic diagrams, performance curves, assembly drawings and tables. The radio receiver includes a separate r-f assembly which permits monitoring on the guard channel while operating on one of the other channels. Published under joint authority of the U. S. War and Navy Departments and the Air Council of the United Kingdom.

PB 15121. U. S. NAVY DEPARTMENT. BUREAU OF AERONAUTICS. Handbook of operating instructions for radio sets AN/ARC-9 and AN/ARC-9X. Revised June 30, 1945. (AN-08-30ARC9-2). 1945. 32 p. Price: Microfilm-50¢ - Photostat-$3.00
Radio Set AN/ARC-9 is designed for installation in aircraft to provide long range, two-way radio telephone communication between aircraft and ground stations or other aircraft, while in flight. Bendix Type MS-44F Remote Control Unit is supplied to permit remote operation of the equipment on all channels. Radio Set AN/ARC-9 operates in the frequency range of 3105 to 6500 kilocycles on the 10 fixed crystal controlled channels. AN/ARC-9 and AN/ARC-9X are identical except for different type dynamotors. Photographs, installation drawings, charts, graphs and schematic diagrams are included. Published under joint authority of the United States War and Navy Departments and the Air council of the United Kingdom.

PB 17446. U. S. NAVY DEPARTMENT. BUREAU OF ENGINEERING. Instructions for radio receiving equipment, Model RAS-4. (Manufactured by the National Company Inc., Malden, Mass.) Apr 1942. 85 p. Price: Microfilm-$1.00 - Photostat-$6.00
The model RAS equipment is a complete superheterodyne radio receiving equipment suitable in all respects for use at Naval radio shore stations or aboard Naval vessels. It has a frequency range of 190 to 30,000 kc. This book contains installation, operation and maintenance instructions, test data, parts lists, diagrams and photographs.

PB 17880. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS Frequency shift equipment model FSD. (Manufactured by Press Wireless, Inc., Chicago, Ill.) Nov 1944. 62 p. Price: Microfilm - $1.00 - Photostat - $5.00
This frequency shift equipment consists of Frequency Shift Keyer CTV-35065 and Rectifier Power Unit CTV-20149. The shift keyer provides a means by which certain types of ... voltages may be employed to convey intelligence on a radio-frequency carrier from any CW radio transmitter. A detailed description of the equipment and the functioning of its parts is given, also instructions for installation, operation and maintenance. Supplementary data includes a block diagram, tube complement data, key to manufacturers, table of component parts, photographs, and schematic diagrams.

PB 17416. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book, Model TCR radiotelephone transmitting equipment. (Manufactured by Radiomarine Corp of America) Jun 1941. 60 p. Price: Microfilm-$1.00 - Photostat-$5.00
The model TCR radiotelephone transmitting equipment is designed primarily for installation in short stations for communication with ships or with other shore stations. The frequency range is 2000 to 3000 Kc; types of emission, MCW and telephony; and the nominal power output is 125 watts. Book presents instructions for installation, adjustment, operation, and maintenance. Tables include parts lists, color code, and list of manufacturers. Schematic drawings and photographs are included.

PB 17879. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instructions for installation and operation of model FSC frequency shift converter. (Manufactured by Electronics Division, Bureau of Ships-Navy Department) (Navships 900,078) Feb 1945. 27 p. Price: Microfilm - $1.00 Photostat - $2.00
This instruction book contains directions for the installation, operation and maintenance of the model FSC frequency shift converter, serial nos. 1 to 70 inclusive, the purpose of which is to demodulate frequency-shift-keyed radio teletype signals. The apparatus functions at audio frequencies and hence may be used with any stable communication receiver equipped with a beat frequency oscillator. Photographs, drawings, and schematics are included.

PB 17997. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for model RBE radio receiving equipment. (Contractor, General Electric Supply Corp. Washington, D.C.) (NavShips 900,261.1 - LB to 900,261.5-IB). Jul 1940. 146 p. Price: Microfilm-$1.50 - Photostat-$10.00
This publication is a series of five instruction books on the above radio receiving equipment. The individual instruction books deal respectively with the combined equipment, the type CMB-50090 single and type CMB 50091 dual preselectors, the type CRA-46142 radio receiver, the type CRA-50079 diversity combining unit, and the type CRA-49140 loud speaker unit. The instruction book for the combined equipment gives a description of the major units. The other four books give circuit description, tube complement, test and trouble location data and spare parts lists of the units with which they are concerned. These books contain photographs of all units and complete diversity radio receiving equipment and covers a range from 540 to 30,000 kilocycles in five bands.

PB 17996. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for models RBC, RBC-1 and RBC-2 radio receiving receiving equipments. (Manufactured by Hammarlund Mfg. Co., Inc., New York, N. Y.). Jan 19, 1943. 40 p. Price: Microfilm-50¢ - Photostat-$4.00
The model RBC equipment is a complete radio receiving equipment, suitable for either headphone or loud speaker reception of radio telephone, CW telegraph, or MCW telegraph signals. The equipment is designed to cover a frequency range from 540 Kc to 31 mc in six bands. The handbook covers the following subjects: tubes, power requirements, antenna requirements, installation, construction, circuit description, operating instructions, maintenance and repair, alignment. There are parts lists, charts, diagrams, curves, and photographs. A circuit diagram of the receiver is included.

PB 17915. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for Model TCE-2 radio transmitting equipment. (Manufactured by Westinghouse Electric & Manufacturing Co., Baltimore, Md.) Mar 1942. 194 p. Price: Microfilm-$2.00 - Photostat-$13.00
The Navy Model TCE-2 Radio Transmitter-Rectifier Equipment is intended for use in certain types of small surface crafts. When used in conjunction with suitable receiving apparatus this equipment will provide communication by telegraph or telephone over a frequency range of 350 to 9050 kilocycles. This instruction book contains detailed description, installation, operation, and maintenance information, parts lists, photographs, diagrams, and commercial bulletins. The equipment is designed for CW, MCW and voice emission and has a power out put from 30 to 125 watts dependent upon the type of emission used.

PB 17947. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for Navy Model RAL-8 radio receiving equipment. (Manufactured by The Magnavox Co., Fort Wayne, Ind.) Jan 19, 1943. 61 p. Price: Microfilm-$1.00 - Photostat-$5.00
These instructions cover the installation, operation, and servicing of the model RAL-8 radio receiving equipment. This equipment is designed for A-C operation, being equipped with a power unit for supplying all operating voltages required from AN A-C source of 110, 115, or 120 volts, 60 cycles, 1 phase. This unit covers the frequency range of 0.3 - 23.0 megacycles and is destined for optimum performance for the reception of tune, modulated or interrupted CW, damped radio telegraph signals, or voice-modulated CW. The output circuit is designed for use with one pair of 600-OHM phones. Parts lists, curves, a photograph, schematic and wiring diagrams are included.

PB 17903. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for Navy model RBZ radio receiving equipment frequency range 2 to 5.8 mcs. (Manufactured by Emerson Radio and Phonograph Corp., New York City, N. Y.) n.d. 55 p. Price: Microfilm-$1.00 - Photostat-$4.00
This is a battery operated receiver of the ultra portable type. The book gives detailed description of the equipment, and installation, operation, maintenance, and servicing instructions. Tables list parts by symbol designation, spare parts, color code for resistors and capacitors, and manufacturers. Photographs and diagrams are included.

PB 17950. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for Navy Models RAO-3 and RAO-4 radio receiving equipment. (Manufactured by Wells-Gardner & Co., Chicago, Illinois). (NavShips 900,389-IB). Sep 19, 1944. 98 p. Price: Microfilm-$1.00 - Photostat-$6.00
This receiving equipment employs 11 tubes in a super-heterodyne circuit and covers in five bands the frequency range of 540-30,000 kc. The receiver is suitable for the reception of MCW, CW, or ICW signals, and is designed for use either at Naval Shore stations or aboard Naval vessels where the radiation of the high frequency oscillator must be less than 400 micro-micro watts as measured at the antenna terminal. The RAO-3 receiver is intended to operate on a 115 volt, 50-60 cycle power supply. The RAO-4 is intended to operate on a 115 or 230 volt, 50-60 cycle power supply. Manual contains installation, operation, and maintenance instructions, circuit description, photographs and drawings, schematic tables, and parts lists.

PB 17949. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for radio receiving equipment Navy Model RAO-5. (Manufactured by Wells-Gardner & Co., Chicago, Ill.) (NavShips 900,498-IB). Nov 19, 1944. 98 p. Price: Microfilm-$1.00 - Photostat-$7.00
Installation, operation, and maintenance instructions for 11-tube, 5 band super-heterodyne receiver covering the frequency range of 540-30,000 kc. The equipment is suitable for the reception of MCW, CW, or ICW signals at Naval Shore stations or aboard Naval vessels where the radiation of the high frequency oscillator must be less than 400 micro-micro watts as measured at the antenna terminal. Contains parts lists, tables, photographs, schematic, and drawings.

PB 17946. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Preliminary instruction book for Navy Model RAO-6 radio receiving equipment. (Manufactured by National Co., Malden, Mass.) Sep 19, 1943. 67 p. Price: Microfilm-$1.00 - Photostat-$5.00
The model RAO-6 equipment is a complete radio receiving unit of the super-heterodyne type suitable for use on U. S. Naval vessels and at Naval Radio Shore stations. The equipment is suitable for the reception of radio, telephone and telegraph signals (either CW or MCW) in the frequency range 540 to 30,000 KC. It is designed for use at installations where radiation from the high frequency oscillation, must be less than 400 micro-micro-watts as measured at the receiver antenna input terminals. The manual contains instructions on the installation, operation and main tenance of the component units. Parts lists, schematic wiring diagram, outline. Drawings and photographs are included.

PB 17945. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Preliminary instruction book for Navy model RAO-6/7/9 radio receiving equipment. (Manufactured by National Co., Inc. Malden, Mass.). (NavShips 900,351-IB). Dec 19, 1944. 71 p. Price: Microfilm-$1.00 - Photostat-$5.00
This manual describes installation, operation, and maintenance of Model RAO-6 equipment, a complete radio receiving equipment of the super-heterodyne type suitable for use on U.S. naval vessels and at naval radio shore stations. The equipment is suitable for the reception of radio, telephone, and telegraph signals (either CW or MCW) in the frequency range from 540 to 30,000 kilocycles. It is designed for use at stations where radiation from the high frequency oscillator, located within the radio receiver, must be less than 400 micro-micro-watts as measured at the receiver antenna input terminals. Parts list, diagrams, schematics, and photographs are included.

PB 17426. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Preliminary instruction book for Navy Model TAJ-17 radio telegraph transmitting equipment. (Manufactured by General Electric Company, Schenectady, N. Y.). (GEI-17988) Jan 1944. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
The Navy Model TAJ-17 radio telegraph transmitting equipment is basically the same as the Navy Model TAJ-11 covered by Preliminary instruction book GEI-16828. The TAJ-17 equipment differs from the TAJ-11 in that it is intended for shore-station application with power supplies of 220 volts, 3-phase, 50 or 60 cycles. Manual lists the component units, rating, power supply, shore installation, and parts lists. Appended are tables and schematic diagrams. This equipment is designed for CW and MCW operation in the frequency range of 17b to 600 kc and has a nominal power output of 3c0/000 watts.

PB 17[illegible]34. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Preliminary instruction book for radio receiving equipment Model RAO-2. (Manufactured by National Company, Malden, Mass.) Apr 19, 1942. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
The model RAO-2 equipment is a complete radio receiving equipment suitable for use on U. S. Naval vessels and at naval radio shore stations. The unit is suitable for the reception of radio telephone and telegraph signals. The equipment is suitable for use at installations where radiation from the high frequency oscillator, must be less than 400 micro-micro-watts as measured at the receiver radio frequency input terminals. The frequency range of the receiver is continuous from 540 to 30,000 kc. Manual contains instructions on the installation, operation and main tenance of the equipment. Parts list, drawings, and a schematic diagram are included.

PB 17428. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Spare parts catalog for Navy model TAB-6/7 radio telegraph transmitting equipment. (Manufactured by Westinghouse Electric and Manufacturing Company, Baltimore, Md.) (NavShips 900,553-(1)). Jan 1945. 28 p. Price: Microfilm-50¢ - Photostat-$2.00

PB 15113. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM, Handbook of maintenance instructions for AN/AIA-2A interphone and radio system. (AN 08-30AIA2-3). 1945. 49 p. Price: Microfilm-50¢ - Photostat-$4.00
This handbook describes the AN/AIA-2A interphone and radio system and furnishes the necessary instructions for its installation, operation, testing, maintenance, and repair. A number of pages are missing from this copy, including the sections on installation and maintenance. Contains table of replaceable parts, drawings and an index.

PB 15120. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for radio set AN/CRT-3. (AN 16-30CRT3-2). 1945. 72 p. Price: Microfilm-50¢ - Photostat-$5.00
Radio set AN/CRT-3 is a simple, rugged emergency transmitting system carried in aircraft designed for operation from a rubber life raft. The set may be dropped over water by means of the parachute supplied. Radio transmission is provided on two distinct frequencies intended for reception by two groups of stations, each having distinct rescue functions. The set automatically transmits in code the international distress signal (SOS). Provision is also made to allow manual keying of the transmitted code signals. Manual contains instructions for installation and adjustment, operation, and maintenance. Illustrated.

PB 16061. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for model AN/AXT-2 aircraft radio equipment. (AN-08-30AXT2-2). 1944. 31 p. Price: Microfilm-50¢ - Photostat-$3.00
The AN/AXT-2 equipment is a radio transmitting system for use in and by aircraft. This equipment may be used in conjunction with a suitable receiver to provide a complete radio system. This handbook provides installation, adjustment, and operation instructions for the AN/AXT-2 equipment. Drawings.

PB 15118. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for radio transmitting set AN/ART-7. (AN 08-30ART7-2). 1944. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Radio transmitting set AN/ART-7 is designed for aircraft installation. It consists of three major units. Radio transmitter T-34/ART-7, rectifier power unit PP-35/ART and one antenna assembly kit. Report contains instructions on installation and adjustment, operation, and emergency operation and repair. Illustrations.

## Electronics

### German

PB 17551. GROSS, MALVERN J. The industrial X-ray field in Germany. (FIAT Final Rept 535.) 1945. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
The purpose of this report is to supplement and summarize a number of exhibits on industrial X-ray equipment and applications being evacuated to the Joint Intelligence Objectives Agency. A list of the material and a bibliography of literature on the materials are included.

PB 15187. LÄPPLE, H. Die lichtbogenlöschung in körnigem loschmittel bei hochspannungssicherungen. (Grainy arc extinguishers in high-voltage fuses). (Reprint from "Elektrotechnische Zeitschrift", Vol. 58, 1937. n.d. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
The paper reviews literature dealing with arc extinguishers of grainy structure in fuses and discusses phenomena accompanying the melting and evaporation of the metal and the following extinguishing of the arc in switches.

PB 8457. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Anordnung zur automatischen peilung. (Arrangement for automatic direction indication). German patent 733522, applied for July 27, 1939, with number T52270 VIIIa/21a4. Original inventor - Jirsa. 1939. 11 p. Price: Microfilm-50¢ - Photostat-$1.00

PB 8406. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Anzeigeeinrichtung zur aufzeichnung einer polarkurve, insbesondere zur aufzeichnung der von einer richtempfänger erhaltenen peilkurve. (Indicator for indication of a polar curve, especially for indication of the direction curve received by a directional receiver.) German patent 734912, applied for May 19, 1939, with number T52270 VIIIa/21a4. Original inventors - Bergtold and Runge. 1939. 7 p. Price: Microfilm - 50¢ - Photostat - $1.00

PB 8460. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Empfangseinrichtung zur aufnahme eines funkfevers. (Receiver for the reception of radio beacon). German patent 173/41, applied for Aug. 7, 1939, with number T52663VIIIa/21a4. Original inventor - Leib. 1939. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This patent is additional to patent 29/41, PB 8446. For a related rejected application see PB 8453.

PB 8456. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Peilempfänger mit rotierendem oder hin- und hergedrehtem peilantennensystem. (Direction finder with rotating direction antenna system or one turning backwards and forwards). German patent 322/42, applied for July 27, 1939, with number T52612 VIII a/21a4. Original inventor - Bergtold. 1939. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an addition to application T51473 VIII a/21a4.

PB 8405. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Temperaturkompensierte, geschirmte spule. (Coil, temperature-compensated and shielded.) German patent 726444, applied for May 17, 1939, with number T52258 VIIIac/21g. Original inventor - Bergtold. 1939. 4 p. Price: Microfilm - 50¢ - Photostat - $1.00

PB 1201. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Treiberstufe für eine im gitterstromgebiet ausgesteuerte stufe eines nieder- oder hochfrequenzverstärkers. (Exciter for a stage controlled in the grid current field, the grid being of a high or low frequency amplifier.) German patent application T61278 VIIIa/21a2, applied for Dec. 11, 1944, and still pending. Original inventor - Ruhrmann. 1944. 6 p. Price: Microfilm - 50¢ - Photostat - $1.00

PB 8459. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Zuführungsleitung für hochfrequenzanordnungen. (Leads for high frequency arrangements). German patent 729925, applied for Aug. 7, 1939, with number T52661 VIIIa/21a4. Original inventor - Hülster. 1939. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
These leads are especially for use in decimeter transmitter and receivers, where constant voltage is required.

PB 11471. U. S. WAR DEPARTMENT, CORPS OF ENGINEERS, ENGINEER BOARD. Engineer Board Letter report, Captured German electric concrete vibrator. (Reg 2196) Feb 1945. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Report of the inspection and evaluation of a captured portable electric concrete vibrator manufactured by Robert Thür Komm.-Ges, Klotzsche/Dresden, Germany. This vibrator was probably used for placing low-slump, high-density concrete in shallow forms, as required during highway or airstrip construction. It is somewhat similar in design and construction to machines marketed commercially by the Mall Tool Company of Chicago, Illinois. Two photographs.

PB 11486. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Engineer Board letter report, Igniter, electric. (Reg 2246 and 2249) Mar 1945. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Brief description of a captured German electrical igniter for electrical firing of non-electric caps. The lead wires are six feet long, made of tinned iron wire and insulated. The item is equipped with match head type ignition and a rubber plug, and is used by placing the match head in the open end of a non-electric cap and crimping the cap to the rubber plug. One photograph.

Japanese

PB 16804. (Japanese) DEIBEL, R. F. Aircraft antenna design. (AAF Air Tech Intelligence Group Rept 35) Nov 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Interrogation of Mr. Kato, Japanese electrical research engineer, with Kokusai Electric Communications Co., on antenna research for aircraft. The use of the vertical fin as a radio antenna and a slit antenna for use with 500 mcs. radar in aircraft were developed and are illustrated by sketches.

United States

PB 14245. ALLEN, JOHN. Performance of the AS/2o1/AP (M2204) antenna system when mounted in metallic recesses. (Harvard Univ Radio Res Lab Rept 411-216) Sep 1945. 37 p. Price: Microfilm-50¢ - Photostat-$3.00
This is a report, fully illustrated by graphs and drawings, of laboratory tests on the above circularly polarized antenna system, to determine its performance in various metallic recesses. Conclusions are drawn regarding the type of mounting which will give satisfactory field patterns and circularity of polarization. It is recommended that the antenna system be mounted in a parabolic reflector 6½ inches in depth and either 30 or 36 inches in diameter, the latter being preferable. The antenna was designed for airborne jamming in the frequency range of 440 to 660 mc.

PB 14223. ANDERSON, R. E. Flight tests of AN/APA-23 recorder. (Harvard Univ Radio Res Lab Rept 411-173) Apr 1945. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes and analyzes the results of flight tests made with the AN/APA-23 radar recorder. This device provides a permanent record of the time and frequency of pulsed or modulated signals that are received within a scanned frequency range. The results indicated that, over flat terrain or water, at an altitude of 5000 feet, radar signals would be recorded out to the radar horizon. The response spread was not excessive and the electrical and mechanical performance of the recorder was very satisfactory during all the tests. The report is illustrated with photographs, graphs, and reproductions of the recorder tape for some of the test runs.

PB 14220. ANGIER, H. O. The RRL M2106 aural doppler attachment for the mark 4 radar. (Harvard Univ Radio Research Lab Rept 411-170) Apr 1945. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes an aural doppler anti-jamming attachment designed for use on Navy Radar Mark 4. This device makes possible the hearing of airplane propeller and doppler modulation of given echoes which are approximately centered in the range notch of the radar. It is, therefore, possible to locate moving targets obscured in clutter by searching in range until characteristic doppler or propeller modulation is heard. The report includes photographs, schematics, graphs, and a parts list of this equipment.

PB 15141. APKER, L. and others. Theory of a double mixer for spectrum analyser applications. (OSRD. Division of Radio Coordination Report 931-17). 1945. 27 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes a K-band cascade double mixer used in the KP-392 Spectrum Analyser (an instrument of a double superheterodyne type covering the frequency range from 10 to 3800 mc). The electrical design is first sketched briefly and the linear network theory as applied to a single crystal mixer is outlined and the results are used in the treatment of the complete mixer as a cascade combination of an input crystal, a filter network, and an output crystal. A list of references and diagrams are included.

PB 15203. BAKER, R. M. and CASSEN, BENEDICT. High power communications jammer. (OSRD Division of Radio Coordination. Report 1107-1). 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This report covers the development and construction of two special frequency modulated oscillators for the "Cigar" project by Westinghouse Electric and Manufacturing Co. Two oscillators of the resonant line type were built, and on each test each oscillator delivered 47 KW of r-f power into a resistance load. The average frequency was set at 40 mc and the frequency modulator produced a total frequency swing of 3.25 mc. The measured plate efficiency was approximately 70 percent. Report includes diagrams. Work described herein originated in experience of Radio Research Laboratory at Harvard University with resonant cavity million volt.

PB 16510. BARDEN, W. A. Conference regarding use of aluminum foil in lieu of high tin foil in condensers. (Army Air Forces. Expt. Eng. Sect. EXP-M-54-656-577). 1942. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Principal objection to the use of aluminum foil is the fact that in connecting leads to the aluminum foil, a type of solder has to be used which corrodes rapidly in the presence of oils of the type used for filling condensers. Deterioration is produced and continues even when the condenser is in storage. A further objection is the variation in the thickness of aluminum foil which prohibits its use on condensers requiring close dimensional tolerances. It was felt that production capacity would be seriously affected by the substitution of aluminum foil for tin foil in condensers.

PB 15204. BARTLETT, DAVID. High power communications jammer. (OSRD Division of Radio Coordination Report 1107-2). 1944. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes the installation of a Westinghouse Ground "Cigar" at Brighton, England. This high power communication jammer was intended to jame the German fighter control system during the invasion and thereafter and discussed briefly. This equipment was developed by Westinghouse Electric and Manufacturing Co. Report includes diagrams.

PB 18340. BETHE, H. A. and SCHWINGER, J. Perturbation theory for cavities. (NDRC Contractor's Rept D1-117) Mar 1943. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
A perturbation theory is developed which permits one to calculate the change of resonant frequency of a cavity caused by some small change of the cavity. It is first applied to the effect of the insertion of a dielectric of small volume on frequency and Q value, e.g., the effect of the glass in a TR box. A method is described by which cavity resonators can be used to measure the dielectric constant and the magnetic permeability of a small sample of material. The effect on the frequency of small changes of shape or volume of the cavity (small plugs), and that of windows in the cavity walls is calculated.

PB 15145. BLEWETT, J. P. The KP-579, a 150 watt magnetron for the 350-780 megacycle range. (OSRD. Division of Radio Coordination Report 931-6). 1944. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes the development by the General Electric Co. of the KP-579 (split anode magnetron) for use as a jamming oscillator. Photographs, diagrams, and graphs.

PB 14028. BLOCH, F. and BAERMESH, M. Reflection of long ropes. (Harvard Univ., Radio Res Lab Tech Memo 411-TM-100) Apr 1944. 8 p. Price: Microfilm-50¢ Photostat-$1.00
A mathematical treatment of the subject of distribution of backscattered radiation of long ropes.

PB 14224. BLOCH, F. Space-charge-limited single-stream solutions in a cylindrical magnetron with small current. (Harvard Univ Radio Res Lab Rept 411-175) May 1945. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
An analytical method is presented and mathematically developed, with which Brillouin's theory of the plane magnetron can be extended to cylindrical magnetrons, provided that the current is small enough - a condition which is generally well satisfied under normal conditions, and is defined exactly in the report. The method allows an expansion in increasing powers of $\epsilon$ and is explicitly carried out to include the linear terms, giving in this approximation the distance of an electron from the cathode as a function of time in terms of simple integrals and with the current an arbitrary function of time. As in Brillouin's theory, it is assumed that the solutions are of the single-stream type where all electrons which at a certain time are found at a given position, have the same velocity. It is then investigated under what conditions this original assumption is justified and it is found that the conditions for a single-stream solution are not nearly so general as they seem from the plane case. In the first place, it is found that an original single-stream solution can break down sooner or later, depending entirely on the time dependence of the current. In the second place, it is shown that any single-stream solution which has been established while a positive current was flowing will break down if a sufficient time has elapsed after cessation of the current. This indicates, at least in certain cases, the possibility of transitory multiple-stream states and, without adequate methods for their investigation, precludes any safe conclusions concerning the ultimate stationary state which must be reached if the anode voltage, after having increased from zero to a certain value, is held fixed.

PB 14125. BOCK, E. L. Comparative field intensity response of M2409 cone dipole and M801 single cone, antennas. (Harvard Univ Radio Res Lab Tech Memo 411-TM-55) Jun 1944. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
The report describes experiments with the subject antennas performed with a view to obtaining an antenna or combination of antennas which would give shipborne service with 360 degrees coverage in both polarizations in the frequency range 300 to 1000 mc. A number of tests are described and a possible solution to the problem indicated in the use of an installation containing one M801 and one M2409 antenna. Photographs, installation drawings, and field intensity curves are included.

PB 15325. BOTHWELL, F. E. and CROUT, P. D. A method for calculating magnetron resonant frequencies and modes. (MIT Radiation Lab Rept 1039) Feb 1946. 62 p. Price: Microfilm-$1.00 - Photostat-$5.00
In this report a procedure is described for calculating the frequency spectrums and modes of oscillation of various types of magnetron tubes. These procedures were developed in 1942 and 1943, and in addition to the cases of the infinite magnetron the finite unstrapped magnetron, and the strapped magnetron, treated in this report, they have been applied successfully to various special types of magnetrons. The procedures are entirely mathematical, and require no experimental work; and the results calculated have been consistently in good agreement with those obtained by experiment. Certain of these results are included. Text is supplemented with drawings, diagrams and graphs.

PB 14222. BYRNE, JOHN F. Class "B" video amplifiers for power amplification of noise energy. (Harvard Univ Radio Research Lab Rept 411-172) Apr 1945. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This report gives a generalized derivation for the efficiency of an ideal linear Class B amplifier. Expressions for efficiency are derived in terms of the peak r-m-s, and average values of excitation voltage. An example is given of the calculation of the power handling capability of a power stage used in the amplification of noise voltage. A graph of amplitude-time relationships of random noise voltages with different amounts of clipping is included in the report.

PB 14114. BYRNE, JOHN F. RCM test equipment summary as of January 1, 1944. (Harvard Univ Radio Res Lab Tech Memo 411-TM-45.) 1944. 7 p. Price: Microfilm-50¢ Photostat-$1.00
This is a survey of test equipment available and under development at the Radio Research Laboratory as of January 1, 1944. Includes list of "Radio Research Laboratory Technical Memoranda Issued To Date". This list is incomplete.

PB 14117. CARAWAY, J. B. Preliminary specifications for E5400 Dina amplifier. (Harvard Univ. Radio Res Lab Tech Memo 411-TM-48.) Oct 1943. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
General description of a high power, class B, radio frequency amplifier designed for use with Dina, AN/APT-1. Photographs of unit included.

PB 16216. CASWELL, A. E. Preliminary handbook of instructions for H2X supersonic trainer, Mark II. (Mass Inst of Tech Radiation Lab Rept M-157A) Apr 1944. 19p p. Price: Microfilm-$2.00 - Photostat-$13.00
A complete description of the electrical and mechanical features of this trainer for the H2X Radar bombsight is given in this handbook. The trainer utilizes all components of the H2X set with which the operator must become familiar, but the H2X transmitting system is replaced with an installation using a piezo-electric crystal as a transmitter. A "Central Station" containing the crystal is moved mechanically over a specially prepared map situated under a few inches of water in a large supersonic tank, to simulate the signals received by the radar set in actual operation. An instructor in a class room controls the motors which move the "central station" and thus can reproduce varying conditions of elevation, air speed, aircraft heading, wind direction, wind speed, and terrain on the H2X components without the necessity of test flights. In addition to full information in installation, theory, operation and maintenance of the equipment the handbook contains a section on the purposes and characteristics of the radar bombsight itself. The handbook contains labeled photographs of all parts of the trainer and a complete set of schematic and mechanical drawings.

PB 14130. CHRISTENSEN, J. W. The C2100 airborne direction finder. (Harvard Univ Radio Res Lab Tech Mem 411-TM-61) Feb 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
A brief description of a light and compact null direction finding attachment for standard receivers. Three separate antenna mounting assemblies have been designed. A diagram and photographs are attached. This report is supplemented by PB 14131 and 14132. The equipment is designed to operate in the frequency range of 100 to 450 mc range.

PB 14131. CHRISTENSEN, J. W. C2100D airborne direction finder. (Harvard Univ Radio Res Lab Tech Memo 411-TM-61A) Mar 1944. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
A very brief description of the C2100D equipment in which three interchangeable antenna heads are used to give complete coverage from 100 to 450 mc. Photographs are included. This report supplements PB 14130.

PB 14132. CHRISTENSEN, J. W. The C2100 airborne direction finder. (Harvard Univ Radio Res Lab Tech Memo 411-TM-61B) May 1944. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
A description of a wiring change which decreases maximum relsyn error from 4 degrees to 1 degree. A schematic is included. Supplements PB 14130.

PB 14235. CLARK, H. and SHAW, E. F. Graphs useful in determining optimum height of jamming antennas. (Harvard Univ Radio Res Lab Rept 411-202) Aug 1945. 74 p. Price: Microfilm-50¢ - Photostat-$5.00
The graphs in this report are largely theoretical but experimental evidence shows that they give a fairly accurate picture. When a signal is transmitted over sea water the field strength at the receiving antenna depends on five variables: frequency, polarization, range, height of jamming antenna, and height of receiving antenna. Most of the graphs in this report assume fixed frequency, polarization and height of receiving antenna and plot field strength versus range for different choices of height of the transmitting antenna. Graphs are given for a frequency range of 200-8000 mc at receiving andtransmitting antenna heights of 40, 80, and 120 feet, and vertical and horizontal polarization. A bibliography is included in this report.

PB 14365. CLARK, H. K. and others. Preliminary instruction book for M6200 (AS/222/APA-17) antenna system. (Harvard Univ Radio Res Lab Rept 411-IB-90) Apr 1945. 38 p. Price: Microfilm-50¢ - Photostat-$3.00
This antenna system includes the following: the M6200 antenna spinner, a direction-finding antenna to be used with the AN/APA-17 airborne direction-finding system for obtaining bi-directional bearings on horizontally-polarized signals in the nominal frequency range 60 to 280 mc; the M6202 remote tuning unit; the M6203 power supply. Photographs, drawings, schematics, and a parts list are included.

PB 14215. COHN, S. B. Design of microwave low-pass filters. (Harvard Univ Radio Res Lab Rept 411-163) Jun 1945. 26 p. Price: Microfilm-50¢ - Photostat-$2.00
Design equations, drawings, and design and performance curves are presented for an easily constructed microwave low-pass filter. This type of filter may be built in waveguide as well as in coaxial line. Spurious response elimination and matching problems are also considered.

PB 14035. COHN, S. B. R-800 "Early warning receiver" (Zero catcher 11). (Harvard Univ Radio Res Lab Tech Memo 411-TM-111) May 1944. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This receiver is designed to warn the pilot of a combat aircraft that he is dangerously close to an enemy radar system, particularly the German Al, GL, or GCI. The warning is given in time for evasive action. The report consists of a very brief description, operating principles, specifications, tube complement, and block diagram. The range of the receiver is 350 to 700 mc.

PB 14255. COHN, S. B. and RICHARDS, P. I. Resume of UHF filter development. (Harvard Univ Radio Res Lab Rept 411-234) Sep 1945. 7 p. Price: Microfilm - 50¢ - Photostat - $1.00
The report gives a brief review of literature on the subject. Two test procedures are given with a treatment of cautions to be observed in their use. One method requires an accurate r-f attenuator whereas the other avoids this requirement. There follows a discussion of discontinuity and other second-order effects. Considerations of practical mechanical design and layout are next presented. Finally, a list of filters developed under RRL project Q-1900 is given along with their essential characteristics.

OSRD

PB 13887. COLUMBIA UNIVERSITY. DIVISION OF WAR RESEARCH. AIRBORNE INSTRUMENTS LABORATORY. Handbook of instructions: Magnetic tape recorder, serial 1, 2, and 3. (Report 1305-9). 1944. 64 p. Price: Microfilm - $1.00 - Photostat - $5.00
It is the purpose of this handbook to provide sufficient information to enable maintenance personnel to make any electrical or mechanical repairs necessary to keep the magnetic tape recorder in good operating condition. The magnetic tape recorder is described in detail with many illustrative photographs. Installation, adjustments, operation and maintenance are covered in the handbook. There is a table of replaceable parts and there are a number of diagrams.

PB 13890. COLUMBIA UNIVERSITY. DIVISION OF WAR RESEARCH. AIRBORNE INSTRUMENTS LABORATORY. Handbook of instructions for PP-130/ARQ-11, rectifier and C-187/ARQ-11, control unit. (OSRD 1305-15) 1945. 27 p. Price: Microfilm - 50¢ - Photostat - $2.00
This handbook provides information to enable maintenance personnel to make any electrical repairs necessary to keep the rectifier, PP-130/ARQ-11 and control unit, C-187/ARQ-11, of AN/ARQ-11 in good operating condition. Photographs, diagrams and tables are included.

PB 14263. CRAWFORD, F. H. and HANE, M. D. A tunable squirrel-cage magnetron (The Donutron). (Harvard Univ Radio Res Lab Rept 411-252) Oct 1945. 36 p. Price: Microfilm - 50¢ - Photostat - $3.00
The donutron is an all-metal squirrel-cage magnetron. It is tuned by the relative axial displacement of alternate anode segments, through flexure of one wall of the cavity in which the anode structure is supported. During the testing of some sixty models, the operating efficiency and the output power have been raised to 40 to 50 percent and around 50 watts respectively (6 to 12-cm range). The best model to date tunes over a 1.5:1 ratio with power flat to 3 db. A single value of voltage and magnetic field is adequate for the entire tuning range. Of the various modes of operation two are important, a long-wave tunable cavity mode and a short-wave resonant re-entrant-line mode. The former can be entirely suppressed and the latter enhanced by a special phase-reversing anode. In the line mode the best powers have been observed. In cold tests, modes around 4 cm as well as indication of even shorter resonances have been found. A wide range of design parameters have been studied. Voltage-current characteristics indicate a static impedance of 700 to 1500 ohms for the tube. Rieke diagrams have been taken for the best tubes. Operation in the short-wave mode is closer to the curves of Bloch than those of Slater or Hartree. This report is illustrated with drawings and graphs.

PB 13277. CROUT, PRESCOTT D. A flux plotting method for obtaining fields satisfying Maxwell's equations with applications to the magnetron. (Mass. Institute of Technology. Radiation Laboratory Rept. 1048). 1946. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
In this report the flux plotting methods which have previously been applied to fields satisfying Laplace's and Poisson's equations are extended to fields satisfying Maxwell's equations. Application is made to the hole and slot, and vane types of magnetron tubes. Tables and figures showing plotting of the areas are given.

PB 13913. DANIELL, C. M. Measured impedance characteristics of cylindrical radiators less than one wavelength long. (Harvard University. Radio Research Laboratory Rept 34). 1943. 19 p. Price: Microfilm - 50¢ - Photostat - $2.00
This report covers the results of measurements made upon cylindrical antenna radiators varying in length from one-eighth to one full wavelength and in ratio of length to diameter from 10 to 236. The obtained data are shown in graphs and respective conclusions made.

PB 16823. DEIBEL, R. F. Airborne radar and communication equipment. (Japanese). (AAF Air Tech Intelligence Group Rept 14) Oct 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a very brief report of an interview with Lt. Comdr. Hitoshi Masaki, I.J.N., a Japanese radar and aircraft radio communication equipment expert. Airborne navigational aids, interphone equipment, airborne radio, and antenna development, are among the subjects mentioned.

PB 15297. DILLINGER, J. R. Line type modulator and HP 10V magnetron operation at 5 megawatts. (MIT Radiation Lab Rept 682-6) Jan 1946. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
This report discusses the development and operation of a d.c. resonance charging, line type modulator with time jitter less than 0.02 useconds. A description of the major components, most of which were laboratory models, is given. This unit has been operated at a repetition rate of 250 pps and pulse duration of useconds for over 500 hours under conditions to give 10.5 megawatts into a 12.5 ohm resistance load at 11.5 kv. Operation of both the iron sponge-mercury cathode series gaps and the cylindrical, aluminum cathode series gaps is discussed. The operating range of the mercury gaps is greater than 2 to 1 and is constant with life and the jitter in firing is less than .02 useconds over most of this range. The range decreases rapidly with time when using the aluminum cathode gaps and the jitter is 1 to 3 useconds. For the mercury cathode gaps to operate satisfactorily, the reverse current must be limited to a very small value. Three HP 10V magnetrons were tested in this circuit. The life of 2 tubes at 2 useconds, 250 pps, and 5.5 to 6 megawatts of input peak power was 6 to 14 hours each. A third tube ran 100 hours at 0.8 useconds, 500 pps, 48.3 kv, and 127 amps, giving a peak power input of 6 megawatts. The magnetic field was 1850 gauss. The sparking rate was 15 to 30 per minute. The cathodes of all 3 of these tubes were badly damaged by this operation. A page of photographs and a few diagrams illustrate the text.

PB 13270. DILLINGER, J. R. Operation of sintered iron sponge-mercury cathode type series gaps at SCI, AEW, and 5 microsecond conditions. (Mass Inst of Tech Radiation Lab Rept 682-5) Jan 1946. 24 p. Price: Microfilm-50¢ - Photostat-$2.00
Some operating characteristics of the sintered iron sponge-mercury cathode type series gaps at SCI, AEW and 5 usec. conditions are discussed. It is shown that a switch consisting of 2 gaps will maintain an operating voltage range of greater than 2 to 1 and time jitter of less than .05 usec. for over 500 hours of operation at 17 kv, 1170 pps, and 1 usec. in a 50 ohm line modulator circuit. Operation at 15 kv, 300 pps, and 2 usec. in a 25 ohm circuit is discussed, and the range shown to be greater than 2 to 1 and time jitter less than .02 usec. with gap life in excess of 500 hours. Operation at 200 pps, 375 amperes, and 5 usec. is satisfactory with range greater than 2 to 1 and jitter less than .05 usec. for over 500 hours. Each of these statements assumes that proper limitations are imposed on the reverse current in the gaps. These limitations are discussed. Design information is given for a trigger circuit which will supply a pulse of amplitude sufficient to obtain maximum range from the gaps, and a rate of rise of voltage sufficient to obtain minimum time jitter. Diagrams, tables, graphs and photographs are included.

PB 16494. DIRCKSEN, A. D. Conference of American Standards Association on Standardization of power type rheostats. (Army Air Forces. Expt. Eng. Sect. EXP-M-54-656-609). Nov 1942. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Conference on specification requirements and test methods for the power type rheostat. Army-Navy-Aeronautical Specification for power type rheostats should be changed to include the requirements and test procedures similar to those previously recommended for the low wattage rheostats. It was also decided that the requirements for the test procedure of the A.N.A. Specification conform to that of the American Standards Association on power type rheostats.

PB 14129. DOW, W. G. REL magnetron program as of December 1, 1943. (Harvard Univ Radio Res Lab Tech Rep 411-ZM-60) Feb 1944. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a very brief tabular description of work on two [illegible] anode and one multi-anode magnetrons.

PB 13285. DUNBAR, A. S. Metal plate lens for $\csc^2$ antenna. (Mass. Institute of Technology. Radiation Laboratory Report 1070). 1946. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes a metal plate lens designed to give a $\csc^2$ energy distribution when used in connection with a [illegible] source. Equations for the lens shape are derived and calculations are made for the angular deviation of rays as a function of frequency. A pattern of the lens used with a L-band pillbox is shown. A bibliograph of 3 items, graphs and [illegible] are appended.

PB 15020. EMBERSON, R. M. Comprehensive report on the U.S.S. Semmes radar installation. (Mass Inst of Tech Radiation Lab Rept 103-3) 1942. 24 p. Price: Microfilm-50¢ - Photostat-$2.00
This report covers 350 hours of operation of SSV-10, Model V radar equipment. It is 10 centimeter, ship borne equipment, used for surface vessel detection. There are many recommendations incorporated in the report for its improvement and operation. A complete description of the set is aided by a drawing of the control cabinet. The set used in a 48" spinner mounted on a platform that is stabilized for roll; a group of hybrid components operating from various primary power supplies, an aircraft type modulator, accurate ranging unit, and a true-bearing PPI indicator. The range of the unit is about equal to optical vision in normal atmospheric conditions and 4 to 5 times greater in abnormal conditions. Spurious signals and their causes are discussed, and suggestions concerning radar operations, logs, watches, training, and maintenance are given.

PB 15324. EVANS, J. W. and others. RF phasing of pulsed magnetrons. (MIT Radiation Lab Rept 1051) Feb 1946. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
This report is a record of experiments which were made to investigate the possibility of controlling the phase of oscillation of a pulsed magnetron by priming the magnetron with power from an external source. It was found that the priming power had to be of the order of $10^{-4}$ times the power output if the phase were to be controlled within a tolerance of about 30°. Graphs and diagrams illustrate the text.

PB 14210. FOSTER, D. The use of continuously rotating direction finders against signals of varying intensity. (Harvard Univ Radio Res Lab Rept 411-158) Feb 1945. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
Direction finders with continuously rotating antennas and azimuthal scope presentations are inaccurate when used to locate rotating beam transmitters since the variation of the field strength at the receiver causes each curve drawn on the scope to indicate a false direction. This report gives two ways of overcoming the difficulty, by rotating the receiving antenna at a high speed and by the use of two receiving antennas. Graphs are included.

PB 14331. FRITTER, W. B. and BOSS, F. W. Development of resnatrons for high power CW ground jammer. (OSRD Rept 747-2). 1944. 88 p. Price: Microfilm-$1.00 - Photostat-$6.00
The principles on which the design of the resonatron depends are first discussed in the introduction. Special attention is given to the design of the grid and to the reasons for concentrating on tetrodes. The two following sections are devoted to a detailed description of the experimental tubes which were built at the Westinghouse Research Laboratories

and the results of a limited number of tests which were made on them. The majority of the testing was done at the Radio Research Laboratories at Harvard University of which, no doubt, there will be a detailed report at some later date. These sections are followed by a more detailed discussion of the principles of construction giving the methods of soldering and discussing the various problems which arise in constructing the different elements of the tube. Finally, there is a discussion of possible applications of the tube to television, high voltage X-rays and dielectric heating. The appendix contains some methods which can be used for calculating the fields in the tube. Drawings and graphs included.

PB 13282. FURRY, W. H., and others. Methods of calculating characteristic values for bilinear M curves. (Mass Inst of Tech Radiation Lab Rept 795) Feb 1946. 75 p. Price: Microfilm-$1.00 - Photostat-$5.00
The fundamental formula for intensity of radiation in the diffraction zone is expressed in terms of heights and horizontal distance measured in natural units, and a formal solution of the boundary value problem is obtained for the case of an M-curve composed of two straight line portions. Several formulas are given for approximate calculation of characteristic values in various limiting cases, but direct numerical solution of the transcendental equation is often necessary. The problem was reformulated with a parabolic segment replacing the angle between the two straight lines. The results indicate that the behavior for the bilinear model is not to be attributed to over-idealization of the model, but is actually characteristic of M curves in which the change of slope is confined to a fairly small part of the thickness of the anomalous layer. Curves are included.

PB 3768. GAFFNEY, F.J. and others. Report of activities of Synchronizer Section. (MIT Radiation Lab Rept I-23.) Nov 1941. 31 p. Price: Microfilm-50¢ - Photostat-$3.00
This report covers ten brief discussions as follows: I-Personnel organization, II-A.I. Synchronizers, III-Self-synchronous synchronizers, IV-Synchronizers for PPI systems, V-Range marking, VI-Sweep calibrator, VII-Modulator test set, VIII-Control boxes for Ratheon 400 cycle modulator, IX-Synchroscope, X-Apparatus constructed or produced. Included in the report is 5 photographs, and 10 wiring diagrams. Some of the diagrams will not reproduce clearly.

PB 11201. GLOVER, A. M. and others. A grid controlled photomultiplier and its application to regeneratively increasing noise output. (OSRD Division of Radio Coordination. Report 1060-1). 1944. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
This is a report on the study by Radio Corporation of America of a photo electron multiplier tube incorporating a grid to control cathode current for the purpose of regeneratively amplifying noise output. Details of structure and characteristics are represented. Possible application is suggested by the improvement in noise output of this tube over that of the 931-A to the extent of 10 in 2 mc/sec band widths, particularly for frequencies up to 5 mc/sec.

PB 15302. GLOVER, A. M. and others. Final report on the investigation and manufacture of noise sources at RCA. (OSRD Division of Radio Coordination Report 1060-2). 1945. 24 p. Price: Microfilm-50¢ - Photostat-$2.00
This report descusses results of investigation of noise sources, during which time an improved tube (the 931A photomultiplier) was developed. Gas tubes as noise sources were also investigated and the results noted. Specially studied were variations due to pressure changes and phenomena associated with the light output of the gas tubes.

PB 14209. GOELZ, A. T., and others. Analysis and application of measurements of radar cross section of airplane models - II. (Harvard Univ., Radio Res Lab Rept 411-157A) Sep 1945. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
Radar cross section data has been useful in the design of jamming antennas, analysis of flak risk, and calculations of window-dropping rates. This report plots radar cross sections as a function of aspect for the following aircraft: B-29 at 75 mc; B-29 at 225 mc; TBM at 200 mc; B-17 at 450 mc; B-24 at 450 mc; A-20 at 600 mc.

PB 14372. HARBURY, P. L. The AT-52/APT, AT-53/APT and AT-54/APT (M313) stub antenna masts, and assemblies which include them. (Harvard Univ Radio Res Lab Rept 411-IB-40) Dec 1944. 55 p. Price: Microfilm-50¢ - Photostat-$4.00
These antennas are designed for airborne installation and operate from 90 to 250 mc. The masts consist of treated maple wood with a heavy layer of copper plating and may be used for either transmitting or receiving. This report discusses the installation, theory of operation, and maintenance of this equipment. Standing wave characteristics, antenna assemblies, stub installations, antenna patterns, and cabling instructions are covered by graphs and drawing in appendices.

PB 14006. HARVARD UNIVERSITY. RADIO RESEARCH LABORATORY. P-3400 magnetron transmitter AN/APT-4. (Tech Memo 411-TM-114) May 1944. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This report very briefly describes the P-3400, a relatively powerful airborne transmitter for barrage jamming of enemy radar systems operating in the frequency range from 150 to 770 Mc. This range is covered in two bands by means of two magnetron oscillator tubes: ZP690 (150-390Mc) and ZP679 (350-770Mc). The transmitter has an output of at least 200 watts up to 600 Mc. Input power is supplied from conventional rectifier-filter circuits, fed from an available airborne 400-cycle power source capable of furnishing the required 1500 watts. One block diagram and a photograph of the equipment are included.

PB 14414. HARVARD UNIVERSITY. RADIO RESEARCH LABORATORY. Preliminary instruction book for the C2100G direction finder. (Rept 411-IB-9D) Jan 1945. 34 p. Price: Microfilm-50¢ - Photostat-$3.00
This report contains sections on general description, installation and adjustment, operation, theory of operation, and maintenance of this equipment. This airborne direction finder is designed to give sharply defined null directional characteristics on signals of either horizontal or vertical polarization over a frequency range of 60 to 750 mc. Photographs of parts, schematics, block diagrams, azimuthal patterns, a table of replaceable parts are included in this publication.

PB 14413. HARVARD UNIVERSITY. RADIO RESEARCH LABORATORY. Preliminary instruction book for the C2121/C2122 adapter kit for C2100 direction finder. (Rept 411-IB-9B) Jan 1945. 34 p. Price: Microfilm-50¢ - Photostat-$3.00
The C2121 adapter kit contains an electric motor drive unit to replace the hydraulic drive, a transformer and switch unit to cover the range 60 to 450 mc, and extension rods to widen the range of the low frequency antenna down to 60 mc for the C2100 direction finder equipment. The C2122 kit is the same as the above except that it includes a second transformer and switch unit for the frequency range 100 to 750 mc. The instruction book contains information on installation, operation, theory, and maintenance of these modification kits, and is illustrated with photographs, schematics, and drawings. The instructions also contain information on the operation of the assembled C2100 airborne direction finder.

PB 14391. HARVARD UNIVERSITY. RADIO RESEARCH LABORATORY. Preliminary instructions for F3903 antenna (AS-263/UPT). (Rept 411-IB-70) Mar 1945. 23 p. Price: Microfilm-50¢ - Photostat-$2.00

The PB3903 shipborne antenna, AS-283/UPT, consists of an adjustable dipole connected to a balanced to unbalances converter (balun) and mounted in a fixed angle corner reflector. It covers the frequency range from 175 to 550 mc with a standing wave ratio of less than 2:1. It may be used for transmitting powers up to approximately 200 watts. The antenna is supplied with a mounting pedestal which permits it to rotate in a horizontal plane and to be used for vertical or horizontal polarization. Includes photographs, graphs, drawings, and parts table.

PB 14120. HARVARD UNIVERSITY. RADIO RESEARCH LABORATORY. RECEIVER DESIGN COMMITTEE. Specifications for a recorder for search receivers. (Tech Memo 411-TM-50A) Feb 1944. 2 p. Price: Microfilm-50¢ - Photostat-$1.00

PB 15197. HELLER, J. I. Electronic tuning for panoramic reception. Final report for period ending Oct. 31, 1944. (OSRD Division of Radio Coordination. Report 1138-3). 1944. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
A brief final report on a study in connection with panoramic reception over a range of 2 to 100 mc. to determine: (A) Maximum frequency modulated sweep obtainable by any electronic means. (B) Best method, principles, and limits applying to electronic tuning and tracking of R.F. amplifier and oscillator stages. Research reported herin was done at the Panoramic Radio Corporation.

PB 15206. HELLER, J. I. Notes of factors affecting the selection of values for use in the phase net of reactance tubes. (OSRD Division of Radio Coordination. Report 1138-2). 1944. 40 p. Price: Microfilm-50¢ - Photostat-$3.00
A study made by the Panoramic Radio Corp. in connection with panoramic reception to determine the optimum values for the R and C components of the phase net commonly associated with reactance tubes. The governing principles are first investigated with simplifying assumptions. A more rigorous analysis is then made involving no impractical assumptions. The formulas are derived.

PB 15205. HELLER, J. I. Notes on oscillators in connection with electronic tuning for panoramic reception. (OSRD Division of Radio Coordination. Report 1138). 1944. 51 p. Price: Microfilm-$1.00 - Photostat-$4.00
In this report the maximum sweep of frequency modulated oscillators is considered and individual circuit variables are separately treated. Sweep linearity is discussed, and the factors effecting it described. Five experimental oscillators, operating over the frequency range between .86 and 100 mc, are described and the experimental results tabulated. This investigation was done by the Panoramic Radio Corporation. Diagrams and graphs are included.

PB 15264. HERRFELD, K. F. A theorem on radial deformation in thick tubes. (Off. Sci. Res. & Dev. Rept. 3209). 27 Jan 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
A thick, long tube is subjected to axially symmetric radial stresses that are distributed in an arbitrary way along the tube, but are located sufficiently far from the ends. It is shown that formulas giving the deformation and the stresses which Lame has developed for uniform pressure are valid here if the uniform deformation is replaced by the integral of the deformation over the length of the tube and the uniform stresses by the integrals of the stresses taken over the length of the tube.

PB 14153. HOGLUND, R. H and others. Wide band waveguide mixers. (Harvard Univ. Radio Res Lab Rept 411-79) Oct 1944. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
Three waveguide mixers are described. One, designed to replace the APR-6 mixer, operates in the 5-10 centimeter range, and is a straight, terminated guide which makes use of a nonuniform cross-section to obtain impedance matching. Two are in the 3-5 centimeter range, one being a scaled down model of the 5-10 centimeter mixer, the other making use of a waveguide loop to obtain a voltage maximum at the crystal. The SWR's remain below 5:1 in all cases except at the low-frequency end of the range, where the waveguide cuts off. The report is illustrated with drawings, a photograph, and curves showing the standing wave ratios of the mixers.

PB 16883. IDE, JOHN M. Performance tests of underwater loud-speaker Model X-3 (Supplement to Report S-1904). (Naval Res Lab Rept S-1934) Aug 1942. 13 p.
Price: Microfilm-50¢ - Photostat-$1.00
The model X-3 underwater loud-speaker is a lightweight (12 lbs.), magnetically driven speaker with balanced central structure and two laminated piston diaphragms moving in phase opposition. The report describes acoustic field measurements employing the model X-3 as a sound source, mounted on the USS Aquamarine. Range run records, reproduced in the report, demonstrate that this underwater speaker produces a output which should be adequate for acoustic minesweeping.

PB 15199. JEPSEN, R. L. A tantalum cylinder cathode for c.w. magnetrons. (OSRD Division of Radio Coordination Report 1043-2). 1945. 22 p. Price: Microfilm-50¢. Photostat-$2.00
This is a report on the development of an L-band tunable CW magnetron designed to deliver 100 watts of power at about 1200 volts. As oxide-coated cathods could not be operated at high current densities a new type of magnetron. This work was done by the Radio Corporation of America. Report includes diagrams and drawings.

PB 14226. KELL, R. E. Summary of A/J developments for ASB radar systems. (Harvard Univ Radio Res Lab Rept 411-178) Apr 1945. 51 p. Price: Microfilm-50¢ - Photostat-$4.00
The Navy ASB is a 515 Mc lobe-switching airborne radar system used for surface search, for homing, and, with an attachment for low-altitude bombing. This report analyzes the vulnerability of this equipment to jamming and describes some anti-jamming devices which have been developed to correct these deficiencies. Among the devices are a mechanism to permit control of the radar transmitter tuning from the operator's position, and a gang-tuning mechanism. Wiring changes are also described. The report is illustrated with photographs, schematics, and graphs.

PB 15154. KOILER, L. R. Constriction oscillator. (OSRD. Division of Radio Coordination. Report 931-6). 1943. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes the study at General Electric Company of the noise output of a constriction oscillator for the purpose of developing a tube suitable for use as a noise generator. Several types of constriction oscillators were built and tested but the project was discontinued because of: (1) the dependence of the output on the pressure of mercury vapor. (2) the non-uniform character of the spectrum (3) the availability of standard tubes which can be used as noise sources. Photographs, drawings, and diagrams are included.

PB 13942. KUCK, B. M. C-1900 "tail attachment". (Harvard University. Radio Research Laboratory. Test Rept. 411-TR-12). 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
Test to determine if a simple crossed dipole horizontally polorized antenna could be used with the C-1900 tail, type III to enable an aircraft to home on radio signals. Tests were run against the following systems: (1) Horizontally polarized SCR-270 radar, (2) horizontally polarized, 10,000 cps shine-wave modulated Mandrel, (3) horizontally polarized noise modulated Dina, (4) vertically polarized SCR-271 radar, (5) vertically polarized, 1000 cps sine-wave modulated SCR-

522, and (6) airborne vertically polarized noise modulated Mandrel. Tail provided satisfactory homing from a range of 70 miles into the SCR-270 radar. When the SCR-270 radar was sweeping, however, homing with tail was unsatisfactory. The tail homing device did not, in general, perform satisfactorily against vertically polarized transmitters of any type, nor against horizontally polarized, noise modulated transmitters of any type, nor against horizontally polarized, noise modulated transmitters. Charts give the horizontal polar pattern of crossed dipole antenna for tail measured at 100 Mc., 130 Mc, and 150 Mc. respectively. Edited by J. J. Wittkopf. Charts.

PB 16539. McCANDLESS, W. H. Runway indicator lights, radio controlled. (Army Air Forces. Engineering Division. ENG-54-556-602A). 1944. 2 p. Price: Microfilm-50¢ . Photostat-$1.00
Sets of red and green runway lights for use on camouflage landing fields, to be lighted from the control tower by means of radio control transmitter. The green lamp at each end is pointed away from the runway and the red lamp pointed in the direction of the runway, parallel to the runway axis. The green light at the upwind and the red light at the downwind end of the runway are to be lighted. Electric power is furnished by storage batteries and the lights are connected to a radio control receiver nearby. As the need for camouflage no longer exists, project has discontinued.

PB 8074. MASSACHUSETTS INSTITUTE OF TECHNOLOGY. RADIATION LABORATORY. Navy roof. (Report R-38). 1941. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
This report states that because of the importance of 10 cm. systems for A.S.V. work, a complete 10 cm. system is to be installed in a penthouse to be built on the roof of a building at the Naval Aircraft Factory in Philadelphia to be used for testing components and training operators. Other subjects covered in this report are: J. R. B. plane; XT-3 truck system; R. F. system report (July 15 to August 2, 1941); report on operation of the screen cage system (July 15 to August 2, 1941, Semmes report (August 2, 1941); progress report of the LJ03 up to and including August 1st; and report on magnetic mechanical p.p.i. (August 7, 1941). Diagrams included.

PB 8075. MASSACHUSETTS INSTITUTE OF TECHNOLOGY. RADIATION LABORATORY. Roof system report: Initial development, February 15 - April 1, 1941. 1941. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
Roof system No. 2 was initiated to fill the need for an "all-out" system to be used in the conduct of research tests, demonstrations of the functioning of AI-10 equipment, and supplementing the activities of the B-18 (originally designated as system No. 1). During the initial stages functions of transmission and receptions were separated. Two 30" parabolas with independent control, equipped with independent antenna systems and transmission lines served this purpose. Extensive tests were carried with different tuning devices and wide variations of the symmetry of the magnetic field. The best combination (highest value of the ratio S/N) was offered with the use of a variable section of line between the magnetron and the first junction. It was found possible to obtain improved signal strength by setting the magnetic field (H) in the appropriate range. Best conditions of signal amplitude and charity were obtained with a slight lateral displacement of the magnetron in a uniform field of area somewhat greater than the pole faces. When the first Lawson T-R box was submitted for test, it made it possible to combine the functions of transmission and reception on one radiator system and concentric line. The experiments with magnetron adjustment and magnetic field appear to indicate the need for additional investigation. Accordingly a complete system of monitoring was instituted together with the construction of Roof System No. 3. This is to be used primarily for study of the R.F. circuit and testing of components. Sketches, diagrams and graphs are included.

PB 14162. MIDDLETON, D. A calculation of the effect of rectification and clipping on the spectra of the output of the 6D4, 884, 178A, and 2D21 noise sources. (Harvard Univ Radio Res Lab Rept 411-90) Jun 1944. 56 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report examines the effect of biasing, or clipping off the bottom of incoming waves of random noise generated by the above sources, on the spectrum of the output of a biased linear and biased quadratic detector. In all cases clipping is found to spread the spectrum and lower the level of the output. Heavy clipping results in essentially uniform output spectra at a low level. The 6D4 in general yields the greatest spectral spread, for a given level, while the 884 and 2D21 follow closely behind in this respect. The 178A, however, produces a narrow spectrum which is but moderately affected by clipping. In all cases greater output spectral width is obtained on using a biased quadratic rectifier, rather than a biased linear detector, if the ratio of bias to r-m-s input noise voltage is less than about 2. Comprehensive curves showing spectra for the four types of source considered in this report are included, and the mathematical development of the theory is given in the last section.

PB 14165. MIDDLETON, D. and others. A theoretical study of the response of saturated linear and quadratic rectifiers to random noise. Calculations for the 6D4 noise source. (Harvard Univ Radio Res Lab Rept 411-97) Oct 1944. 96 p. Price: Microfilm-$1.00 - Photostat-$7.00
A mathematical and graphic treatment of the subject. Extensive curves illustrating the performance of the 6D4 tube under various conditions of cut-off, saturation, and rectifier response are included in the report.

Also PB 2638

PB 12125. MILLER, P. H. and others. Noise spectrum of silicon rectifiers. (NDRC Rept 14-286) Mar 1944. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
The noise temperature (t) of silicon rectifiers has been measured in the range 1 k.c. to 1 m.c. t has been found to be orders of magnitude greater in this region than at 30 m.c. to be roughly proportional to D.C. bias squared in the back direction, and to vary as 1/frequency for both D.C. bias and R.F. These characteristics are the same as found by other investigators for carbon microphones and thin metal resistors. There is a rough correlation between 30 m.c. noise with R.F. and 1 k.c. noise with forward D.C. bias. Work was done at the University of Pennsylvania. Wiring and noise temperature charts are included. A bibliography of 10 items is to be found in the text of the report.

PB 13934. MONROE, R. B. and RHIGER, R. R. R-805, "Zero catcher pre-amplifier unit". (Harvard University. Radio Research Lab. Test Rept. 411-TR-3A). 1944. 4 p. Price: Microfilm - 50¢ - Photostat - $1.00
This pre-amplifier is a two-stage audio amplifier immediately following the detector tube in r-f filter-detector-pre-amplifier unit. Its purpose is to amplify the low level output of the detector tube before transmission of the signal to the main "zero catcher amplifier unit". The pre-amplifier, detector, and r-f filter are built into one unit; however, this report covers only the tests performed on the pre-amplifier section. Test results are shown in a graph.

PB 15032. MOORE, T. M. A description of AN/TPS-10 and its performance in mountainous terrain. (Mass Inst of Tech Radiation Lab Rept 606) 1944. 16 p. Price: Microfilm-50¢ - Photostat-$1.00
The AN/TPS-10 (Little Abner) is a light weight, portable radar which may be used for short range search (50 miles) and height findings. Because of its short wave length (X-band), its narrow beam, and the type of scan employed, the performance is more independent of terrain than other sets now in production or design. Drawings and charts.

PB 15303. NOTTINGHAM, W. B. Notes on photometry, colorimetry and an explanation of the cantibel scale. (MIT Radiation Lab Rept 804) Dec 1945. 237 p. Price: Microfilm-$2.50 - Photostat-$16.00

A brief discussion of the response properties of the human eye is given as a prelude to the formulation of equations and relations that yield the quantitative background for definitions of the terms used in radiometric measurements. Colormathing properties of the eye are discussed in association with the experiments that formed the basis of the ICI system of color specification. A critical analysis of the steps that intervene between the color-matching experiments and the formulation of the ICI system is presented. Explanations are given of the methods by which computations are made to establish the correct specification of various samples of luminance. The background and derivation is presented for the centibel system of expression and computation of objective radiometric measurements. Equations are given for radiometric properties of tungsten surfaces at high temperature, emissivity, "brightness" temperature, absolute temperature and color temperature. The concept of using a system of scotopic units including sco-candle, sco-lumen, etc. is explained and advocated. The use of the centibel system in association with a photoelectric colorimeter is explained in detail and applied to luminance of the cathode ray tube. This report contains 27 graphs and diagrams.

PB 14121. O'BRIEN, R. S. A/J doctoring of FD radar. (Harvard Univ Radio Res Lab Tech Memo 411-TM-51) Feb 1943. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
A brief summary is given of tests with an anti-jamming unit designed at NRL to be used with Mark IV FD radar. The report also gives a number of suggestions for anti-jamming devices which would improve operation of FD radar.

PB 13914. OLIPHANT, C. W. The RRL Mandrel transmitter (Army: BC-183). (Harvard University Radio Research Laboratory Rept. 35). 1943. 32 p. Price: Microfilm - 50¢ - Photostat - $3.00
This report describes the RRL Mandrel as an airborne, barrage-jamming transmitter intended to obliterate or confuse the information presented by enemy radar sets operating in the frequency range 85-135 Mc. The output of the modulator is a random noise voltage with frequency components from 20 kc to 4.5 Mc. This voltage is impressed on the grid of a power amplifier to produce an amplitude-modulated carrier. The transmitter output consists of the carrier and sidebands containing the noise components. The power output is between 9.5 and 12 watts (modulated). Photographs and diagrams included.

PB 15212. COTTRELAND, E. Final report on noise source investigations at Ballantine laboratories. (OSRD Division of Radio Coordiantion. Report 1176-3). 1944. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
This is a final report on research made at the Ballantine Laboratories on various types of noise sources. The aim of the report is to consolidate the evidence gathered and draw conclusions where possible. The death of Mr. Stuart Ballantine terminated the project which included research on gas tubes, audio noise sources, electrolytic noise sources and spark gap noise sources. Photographs, diagrams and graphs.

PB 15207. OSWALD, A. A. Final report on prototype model production (PAD). (Correspondence covering period 20 Oct 43 - 13 Dec 44). (OSRD Div of Radio Coordination Rept 1179) n.d. 71 p. Price: Microfilm-$1.00 - Photostat-$5.00

PB 14388. PAN, W. Y. and COWAN, F. P. Modifications of BC-412 range indicator of SCR-268 upon installation of M1601 and M1602 (BC-1334 and BC-1335) for sets equipped with IFF attachment. (Harvard Univ Radio Res Lab Rept 411-IB-62A) May 1945. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
This publication is supplementary to Radio Research Lab Rept 411-IB-62 which describes the M1601 and M1602 modifications units for the SCR-268. The use of IFF with the SCR-268 requires additional wiring and cabling changes in the range indicator which are described here. The report contains a plan drawing, wiring diagram, and block diagram.

PB 14227. PAN, W. Y. and O'BRIEN, R. S. Summary of A/J developments for the SCR-268 radar system. (Harvard Univ Radio Res Lab Rept 411-179) May 1945. 72 p. Price: Microfilm-$1.00 - Photostat-$5.00
This report describes a number of attachments and wiring modifications designed to overcome the extreme susceptibility of the SCR - 268 to jamming. The resulting improvement in J/S ratio for satisfactory operation amounts to about 30 db. Photographs, graphs, and schematics are included, showing the new units and the result of their use.

PB 14264. PEARSON, PAUL A. and CHRISTENSEN, JOHN V. Attenuation in waveguide at 3000 MC due to moisture condensation. (Harvard Univ Radio Res Lab Rept 411-25) Oct 1945. 14 p. Price: Microfilm - 50¢ - Photostat - $1.00
Test procedure and theory of measurements are discussed in this report which is illustrated by a drawing of the test equipment and by graphs of the results. Attenuation in 1½-inch by 3-inch waveguide of 3000 Mc r-f energy was measured for various degrees of moisture condensation and found to vary between .003 and .015 db per foot as long as puddles were not present, and to become as high as 1.7 db per foot with large drops and puddles. Attenuation was slightly less for sea water than for distilled water. Power loss vs. standing-wave ratio was measured as the terminating load was varied. Results indicated power loss to be roughly linear with SWR, becoming twenty percent with an SWR of four.

PB 15295. PERRY, H. A. JR. Electrical test methods for radomes. (MIT Radiation Lab Rept 483-26 Radome Bulletin 26) Jan 1946. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
The need for the electrical testing of radomes arose early in the development of microwave radar. The undesirable effects of a radome on a radar system which result from reduced transmission, increased reflection, and deviation in the radar beam, are reduced round-trip power, pulling of the magnetron frequency, and distortion in the antenna pattern. Methods are required for testing for the presence of harmful effects and for determining their causes. Over-all system tests are usually desirable, but rarely sufficient. A test method is given for measurement of transmission through a small area of the radome at a time. The pulling test consists of a measurement of reflection coefficient at positions $\frac{1}{4}\lambda$ apart. Considerable attention is devoted to equipment for these and pattern and boresight tests.

PB 15022. POSIN, D. Q. and others. Experiments in microwave breakdown. (Mass Inst of Tech Radiation Lab Rept 731) 1945. 83 p. Price: Microfilm-$1.00 - Photostat-$6.00
Experiments were conducted on electrical breakdown at microwave frequencies using several sizes of air gaps in waveguide. The variation of breakdown was studied as a function of a number of parameters, and findings are given on the effects of: (1) pressure, (2) initial ionization, (3) gap width, (4) pulse width, (5) repetition rate, (6) humidity, (7) surface points.

PB 13913. REDDY, P. H. Operating instructions for the C1700 homing device attachment "Fanny". (Harvard University. Radio Research Laboratory Rept 30). 1943. 11 p. Price: Microfilm - 50¢ - Photostat - $1.00
The described homing device is a simple electrical unit which, when used with any existing receiver and the proper antenna, will allow an aircraft to home on a received r-f signal. It gives an aural indication of the received signal strength, so making it possible to determine when a null of the antenna pattern coincides with the direction of the incident signal. An antenna system is used which has a null forward and in line with the axis of the plane. Principles of operation and circuit details are given. Photographs and diagrams.

PB 14176. RICHARDS, P. Spurious responses in a transmission-line low-pass filter. (Harvard Univ Radio Res Lab Rept 411-115b) Mar 1945. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
Formulas are derived which make it possible to design one type of low pass filter so that some of the spurious pass bands cancel, and more nearly ideal low pass characteristics are obtained.

PB 14435. RIFE, WAYNE E. Modeling the direction finding loop antenna: application to a model of a B-24 aircraft. (NDRC Div of Radio Coordination Rept 100-3) Jan 1945. 48 p. Price: Microfilm-50¢ - Photostat-$4.00
This report describes the use of a modeling technique as applied to the testing of a DF antenna for the frequency 15 to 30 mc. This technique had previously been used in measuring radiation patterns. In using this method a plane model is built to a scale 1/n and the test frequency is increased n times. In the work described in the report, the DF antenna was larger than scale size but was considered satisfactory because it was still small in comparison with the wavelengths used. The model, in these tests, was mounted as a tower on which it could be oriented at any angle, placed in a modulated r-f beam transmitted from a horn radiator, the model antenna being used as a receiver, with results recorded on test instruments. Test results are given in radiation patterns and calibration curves.

PB 15038. HOLLMAN, R. F. Results of tests on use of Rebecca-Eureka by the Army Ground Forces. (Mass Inst of Tech Radiation Lab Rept 500) 1944. 58 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report deals with tests of the Rebecca-Eureka system for obtaining range and azimuth information concerning one ground point in respect to a second ground point. An analysis of a representative set of performance data for a simulated system under field conditions indicates its performance above the minimum requirements of the services.

PB 14257. RUTHBERG, STANLEY. Cold-cathode gas-tube noise generators. (Harvard Univ Radio Res Lab Rept 411-118) Sep 1945. 10 p. Price: Microfilm - 50¢ - Photostat - $1.00
Three types of cold-cathode gas tubes were examined and found to be similar in general characteristics to the hot-cathode type except that they operated at higher voltages. Oscillations and noise are generated, and may be controlled with a transverse magnetic field. The types examined were: glow tube, mercury arc with mercury-pool electrodes, and corona-discharge monode. Of the three the glow tube is best for noise production, but less practical than the hot cathode because of the high voltages and currents required. The report is illustrated by drawings, and graphs of test results.

PB 13910. SARD, R.D. Calculated frequency spectrum of RCA 931 noise source. (Harvard University. Radio Research Laboratory Rept 26) 1943. 20 p. Price: Microfilm - 50¢ - Photostat - $2.00
This report presents experiments in which the RCA 931 phototube was used as source of noise in the frequency band of the enemy's radar or communication equipment. A theoretical estimate was made of the frequency dependence of the noise output from this tube and found that when the tube and found that when the tube is operated with 70 volts per stage, the output should be down only about 1 db around 200 Mc but should reach -6 db around 500 Mc. Two methods of extending the spectrum are suggested. Graphs and diagrams included.

PB 15140. SCHRAM, M. C. Preproduction experience with 100-1000 watt CW magnetrons for the 90-1500 megacycle range. 1945. 257 p. Price: Microfilm-$3.00 - Photostat-$10.00
The class of tubes described in this report prepared at General Electric Company under contract with NDRC, are the split anode variety of magnetron known as the "Flute" tubes. The general design and operating characteristics are described, but the major portion of the report is devoted to diagrammatic sketches and curves.

PB 15018. SEVERINGHAUS, J. W. Instructions for operation of high gain video amplifier for 74-E synchroscope. (Mass Inst of Tech. Radiation Lab Rept M-166) 1944. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
The amplifier is a four stage R-C coupled video amplifier employing shunt peaking coils in series with load resistors. It was designed to view RF pulses from test sets and signal generators. It accepts only negative signals. The input impedance is 1000 ohms, used to terminate the crystal used in the RF line. The gain for a pulse is 1600-2000, and deflection is proportional to power up to 2½" deflection. The rise time for a transient is about .04 microseconds. The manual gives information as to the description, operation, and maintenance of the amplifier when used with the P4-E synchroscope. Frequency and linearity curves, photographs, circuit and change diagrams, and a parts list are included.

PB 15301. SHERMAN, DORA F. Two circularly polarized S-band horns. (MIT Radiation Lab Rept 980) Jan 1946. 11 p. Price: Microfilm-50¢ - Photostat-$2.00
Two types of circularly polarized S-band antennas are described. The first of these, characterized by the ability to produce circularly polarized radiation over the entire S-band, is essentially a dielectric wedge placed at 45° to the plane of the E-vector in round S-band wave guide. The second of these antennas, characterized by very light weight (1/2 lb.) and small physical dimensions (1½ x 4½ x 3 inches), is an adaptation of the bread band coaxial line horn described in Radiation Laboratory Report #770. Graphs, diagrams, and drawings illustrate the report.

PB 15309. SIEGERT, A.J.F. and MARTIN, F.W. Fluctuation in the return signals from random scatterers (window, rain, sea echo). (MIT Radiation Lab Rept 773) Jan 1946. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
The joint probability $W_2(I_1, I_2, t)$ of obtaining return signals $I_1$, $I_2$ a time $t$ apart has been recalculated with assumptions more general than those in R.L. Report 465. The form of the result remains the same as in the special case, but the correlation function is now given by

$$g^2(t) = \left(\frac{1}{r^2}\right)^2 \left| \int_0^\infty r^2 dr \int_{-\infty}^{\infty} w(r,u) \exp\left[4\pi i \frac{ut}{\lambda}\right] du \right|^2$$

where $w(r,u)\,dr\,du$ is the probability that a scatterer returns a field of amplitude between $r$ and $r+dr$ and that its velocity component in the direction away from the transmitter has a value between $u$ and $u+du$, and $\lambda$ is the radar wavelength. Using this correlation function, the spectrum has been calculated, and some information about the velocity distribution of the scatterers has been deduced from H. Goldstein's preliminary measurements of the spectra of rain, window, and sea return. Some examples of actual cloud spectra obtained by Group 44 and a short description of the experimental method are included.

PB 16417. SINCLAIR, GEORGE. C-11 antenna patterns for aircraft, covering studies and experimental investigations in connection with antenna patterns for aircraft and tanks, and the measurement of impedances, by means of models. (OSRD Report 1814). 1943. 104 p. Price: Microfilm-$1.50 - Photostat-$7.00
By using various types of antennas and placing them at different locations on a variety of types of aircraft, and testing them at various frequencies, it was found possible to predict with fair assurance the probable pattern of an antenna at a particular location on any given airplane at a specified frequency. It was determined that a curved antenna eliminated the cone of silence encountered when a tank with a vertical antenna was located directly beneath an airplane and was communicating with it. In tank-to-tank communication, ground reflections and frequency used influenced antenna patterns. Impedance measurement was found to be best accomplished by the standing-wave method and a modification of Chipman's method. There are five appendices which consider (1) the measurement of ellipticity of polarization, (2) the transmission of plane waves through a dielectric layer, (3) impedance measurements methods at ultra-high frequencies, (4) the reciprocity

between transmitting and receiving antennas, and (5) a discussion on the types of oscillators needed for use in the measurement of patterns. There are 52 pages of illustrative material showing drawings of antenna patterns, equipment outline drawings, graphs, test diagrams, and photographs of models and equipment.

PB 16433. SINCLAIR, G. and RITZ, W. Final report on contract NDCrc-100. (NDRC Div of Radio Coordination Rept 10-4) Oct 1940. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
This report summarizes research conducted under contract NDCrc-100 by the Ohio State University Research Foundation. The general aim of the program was to investigate the characteristics of airborne antennas. In carrying out this program stress was placed on the development of the methods and equipment for measuring the patterns and impedance of aircraft and tank antennas by using models. A review of principles and methods used in the studies is given. A list of reports issued under the contract is appended to this paper.

PB 14211. SODERMAN, R. A. Applications of butterfly circuits. (Harvard Univ Radio Res Lab Rept 411-159) Feb 1945. 33 p. Price: Microfilm-50¢ - Photostat-$3.00
Butterfly circuits are very useful in broad band oscillators, tuned mixers, tuned detectors, and other applications requiring moderately high Q, broad band, selective circuits in the frequency range from 100 to about 1200 mc. They are small, light-weight and rugged, but are, in some cases, moderately difficult to build due to the tolerances involved. Characteristic of several types of butterflies which are used in service and commercial equipment are listed. Report includes photographs, graphs, and drawings.

PB 15300. SMITH, W. O. A broad band TEM pill box. (MIT Radiation Lab Rept 901) Jan 1946. 18 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes a broad-band TEM pill box which has been constructed by stacking two simple pill boxes and displacing them by a distance a $-\lambda_0/4$ where $\lambda_0$ is the wave length of free space. They, further, are fed from single branches of a special bifurcating feed, with each branch placed at the focus of the parabola reflecting its energy. The optical paths in the single branches of the feed differ by $\lambda_g/4$ where $\lambda_g$ is the wave length in guide. It is shown that this arrangement produces no change in phase of the wave proceeding from the mouth of the pill box over that of a single pill box, and further no change of impedance occurs when the wave length is changed. Experimental work is reported.

PB 15299. SMITH, W. O. A flat plate beam-shaping antenna. (MIT Radiation Lab Rept 903) Jan 1946. 26 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes and enumerates some beam-shaping characteristics of a flat-plate type antenna. It consists of a pill-box which has one face plate extended to form an image plane. The patterns so obtained are of the cosecant-squared type. An account of some of its properties is given. Diagrams and graphs are included.

PB 15298. SMULLIN, L. D. X-band beacon reference cavities. (MIT Radiation Lab Rept 972) Jan 1946. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
The purpose of this report is to summarize the present status of X-band beacon reference cavities. The general construction is described, but other than critical electrical dimensions, no detailed mechanical description is made. Electrical performance characteristics, and especially frequency stability are discussed. A number of miscellaneous calculations concerned with possible frequency errors are made. Photographs, diagrams and graphs illustrate the text.

PB 14258. SPANGENBERG, K. R. The universal characteristics of triple-resonant-circuit band-pass filters. (Harvard Univ Radio Res Lab Rept 411-240) Sep 1945. 21 p. Price: Microfilm - 50¢ - Photostat - $2.00
This report presents a mathematical and graphical analysis of the subject. The universal insertion-loss vs. frequency characteristics of a band-pass filter composed of one, two, or three lossless resonant circuits in a loosely coupled cascade connection between a source and a load impedance are given. The effects of load and source coupling and of inter-mesh coupling upon pass-band insertion-loss variations and upon bandwidth are discussed.

PB 13916. STEPHENSON, J. G. CW oscillators using the experimental GE L-3 triode in coaxial line circuits. (Harvard University. Radio Research Laboratory Rept 38). 1943. 10 p. Price: Microfilm - 50¢ - Photostat - $1.00
This report summarizes experiments with the L-3 tube as a CW oscillator, using concentric line type construction of the tuned circuits. At the time of writing, the L-3 tube is still in the experimental stage and the results should not be considered as final. It should also be kept in mind that all L-3 tubes thus far received have shown wide variations in characteristics and performance. Only four tubes out of about twelve have equalled the best performance cited in this report. Graph and diagrams included.

PB 20595. STIBER, SAMUEL. Report on the development of radio set AN/TRD-2. Dec 1945. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
Radio Set AN/TRD-2 was designed to provide a portable and mobile direction finder giving instantaneous indications in automatic sense. This direction finder is unique in that the instantaneous indication of the oscilloscope is a single line generated from the center of the screen of a length proportional to the signal strength, and the angular position of which indicates the direction of arrival of the signal without sense ambiguity. An additional feature is that noise and modulation are almost completely eliminated from the visual indication. Although capable of considerable mechanical and electrical refinement, the laboratory model performed in accordance with expectations, and to date is the only instantaneous direction finder developed in these laboratories which would be capable of operation when mounted in a vehicle as small as a jeep. Although the project under which the AN/TRD-2 was developed has been cancelled, recommendations are made as to possible applications and improvements, should investigation of this unique type of direction finder be resumed at a later date. The frequency range of this equipment is 1.5 to 18 mc. Photographs, drawings, and schematics are included.

PB 14392. SWINNEY, J.G.C. JR. Preliminary instruction book for the M4902 airborne "S" band circularly-polarized radiator. (Harvard Univ Radio Res Lab Rept 411-171) Mar 1945. 24 p. Price: Microfilm-50¢ - Photostat-$2.00
This is an airborne, horn type antenna which operates over the frequency range from 2310 to 4000 mc. It provides substantially circularly-polarized radiation, distributed essentially in a single-lobed, symmetrical pattern about 90 degrees wide between half power points. The instruction book contains photographs, graphs, drawings and parts tabs.

PB 14256. SWINNEY, J.G.C., JR. R-F conductors and fittings. (Harvard Univ Radio Res Lab Rept 411-237) Sep 1945. 42 p. Price: Microfilm-50¢ - Photostat-$3.00
This report gives a summary of the work of RRL Project T1M1 which was established "to obtain and disseminate information concerning r-f conductors and fittings and to develop further r-f conductors and fittings when necessary". It contains a listing of work done at RRL on r-f coaxial connectors and on general r-f components; a summary of conductor and fitting design data from the point of view of the needs of the Radiation Laboratory; a review of the subject of national and international standardization of r-f cables; and an outline of a program for obtaining necessary design data. Numerous lists, tables, and graphs are included.

PB 6371. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Abänderung eines peilantennensystems. (Modification of a direction finder aerial system.) German patent 727237, applied for March 11, 1939, with number 751930 VIIIa/21a4, being an addition to patent application 751409 VIIIa/21a4. Original inventor - Kämmich. 1939. 4 p. Price: Microfilm - 50¢ - Photostat - $1.00

PB 6427. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Anordnung zur modulation ultrakurzer wellen. (Arrangement for the modulation of ultra short waves.) German patent 739534, applied for June 22, 1939 with number T52416 VIIIa/21a4. Original inventors - von Beeyer and Tischer. 1939. 6 p. Price: Microfilm - 50¢ - Photostat - $1.00

PB 6403. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Anzeigeeinrichtung für die einfallerichtung einer von einem peilempfänger aufgenommenen electromagnetischen welle. (Indicator for the direction of incidenct of an electromagnetic wave picked up by a direction receiver.) German patent 723513, applied for May 11, 1939, with number T52230 VIIIa/21a4. Original inventors - Bergtold and Runge. 1939. 6 p. Price: Microfilm - 50¢ - Photostat - $1.00

PB 8393. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Elektronenschalter. (An electron switch) (German patent application 723401 applied for Apr 21, 1939, with number T52145 VIII c/21g. Rept. 5694). Original inventor: Schröter. 1939. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
An electron switching arrangement characterized by one or more revolving cathodes opposing a multitude of fixed anodes. The revolving portion of this vacuum tube consists of a cathode and control grid. The control grid may be energized by either capacitive or inductive coupling. The inventor states this switch can be used for television or multi-channel rapid telegraphy, and other uses.

PB 10966. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Nachteffektfreies peilsystem. (Direction finding system free of night effect). German patent 172/41, applied for Aug. 7, 1939, with number T52662 VIII a/21a4. Original inventor - Bergtold. 1939. 11 p. Price: Microfilm-50¢ - Photostat-$1.00

PB 8411. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Peilempfänger mit rotierender oder hin- und hergeschwenktem richtantennensystem. (Direction finder with directional antenna system rotating or swinging to and fro.) German patent 710498, applied for May 23, 1939, with number T52294 VIIa/21a4. Original inventor - Bergtold. 1939. 8 p. Price: Microfilm - 50¢ - Photostat - $1.00

PB 14266. TURNBULL, J. C. and others. Measurements on wide-band coaxial lines. (Harvard Univ Radio Res Lab Rept 411-256) Sep 1945. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Information and graphs are presented relating to tests of coaxial lines of three different designs for standing-wave ratio and attenuation at different frequencies between 500 and 2500 mc. Beaded lines have been found unsatisfactory from the standpoint of reflections. A longitudinally supported line, in which the support consists of six, ¼ in. polystyrene tubes, appears to be the best line for low reflection and low attenuation. Further improvement in this type of line is discussed.

PB 15044. U. S. ARMY SIGNAL CORPS. Suppression applied to engine models 1M-21 and B (Kohler Company, Kohler, Wisconsin). (Engineering Memorandum D-342-B-P-45). 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
The subject engines and their associated electrical components are effectively suppressed for radiated interference over the frequency range of 0.55 through 186.0 megacycles at a distance of 25 feet from the unit when suppression components are applied as outlined in the report and sketches.

PB 17894. U. S. NAVY DEPARTMENT. Installation, operation and maintenance instructions for the Models MJ-1 and MJ-2 depth indicating and recording equipments. (Manufactured by Submarine Signal Co., Boston, Mass.) (Sub. Sig. Spec. 8016) 1940. 85 p. Price: Microfilm - $1.00 - Photostat - $6.00
The models MJ-1 and MJ-2 are devices for indicating and recording harbor or ocean depths by producing a suitable sound signal on vessels equipped with the apparatus. The sound producing and receiving oscillators operate at a frequency of about 22,500 cps. The MJ-1 model operates from A24 voct direct current source and the model MJ-2 equipment operates from A115 volt direct current source. Manual gives instructions on installation, operation and lubrication of equipment, keys to location of irregularities, part lists, drawings, connection wiring and schematic diagrams.

PB 17895. U. S. NAVY DEPARTMENT. Installation, operation and maintenance instructions for Models MJ-3 and MJ-9 echo sounding and recording equipment. (Manufactured by Submarine Signal Co., Boston, Mass.) (Sub Sig. Spec. 8345) 1942. 112 p. Price: Microfilm - $1.50 - Photostat - $8.00
The Models MJ-3 and MJ-9 measure and record ocean depths by producing a supersonic signal in the water and measuring the time elapsing before the return of its echo from the sea bottom. Manual gives detailed instruction on installation, operation and maintenance of equipment. Supplementary data includes: Parts lists, schematic wiring diagrams and drawings.

PB 17992. U. S. NAVY DEPARTMENT. Installation, operation and maintenance instructions for models QCQ-1, QCS-2, QCS-3, QCE-2, and QCE-3 echo ranging equipments. (Manufactured by Submarine Signal Company, Boston, Mass.). Nov 19, 1939. 207 p. Price: Microfilm-$2.50 - Photostat-$14.00
The echo ranging equipment described herein consists of both altered and unaltered units of other equipments, supplied under previous contracts, and such additional new units as were necessary to modernize the old models. Included are descriptions of the echo ranging units, the hoist-train system and power units with principles of their operation; instructions for installation, operating and maintenance; lists of parts, tabular data on coils, chokes and transformers; and an appendix giving special insturctions for test and alignment of the receiver-amplifiers. Photographs, schematics, wiring diagrams, and drawings accompany the instructions.

PB 17435. U. S. NAVY DEPARTMENT. Instructions, radio direction finder Model DG. (Manufactured by Wireless Specialty Apparatus Co., Boston, Mass.) Aug 1929. 49 p. Price: Microfilm-50¢ - Photostat-$4.00
This report contains instructions for the installation, adjustment and operation of the DG medium frequency radio direction finder for shipboard use. The report also contains operating instructions for the radio compass, model DG. Schematic and wiring diagrams.

PB 17889. U. S. NAVY DEPARTMENT. Preliminary installation, operation and maintenance instructions for the Model JK-9 sound listening equipment. (Manufactured by Submarine Signal Co., Boston, Mass.) (Sub. Sig. Spec. 8480A) 1941. 20 p. Price: Microfilm - 50¢ - Photostat - $2.00
The model JK-9 sound listening equipment is designed to detect the presence of high frequency under water sound originating from propellers or machinery of moving vessels and to indicate direction from which it comes. Manual gives a description of the apparatus, operation, installation and maintenance instructions. Supplementary data include schematic and connection wiring diagrams and parts list.

PB 15123. U. S. NAVY DEPARTMENT. BUREAU OF AERONAUTICS. Handbook of maintenance instructions for radio receiving set AN/ARW-26. (AN 16-30 ARW 26-2). June 6, 1945. 38 p. Price: Microfilm-50¢ - Photostat-$3.00
Radio receiving set AN/ARW-26 forms the receiving end of a radio-remote-control system. Used with associated equipment controlled from a distant station, it directs the operations of a target airplane. The carrier frequency can be set between 6 and 73 megacycles. Batteries contained in Battery Box CY-237/ARW-26 supply all the power necessary for operating the target control receiving equipment. The power furnished is sufficient to allow continuous operation of the equipment for approximately 2½ hours or intermittent operation for 8 hours. Any external load drawn from the battery in addition to the current required by Radio Receiver and Selector R-116/ARW-26 will reduce the operating time proportionallly to the load. Photographs of the unit and of its components, chart of common troubles, parts list and installation drawings are included.

PB 13564. U. S. NAVY DEPARTMENT. BUREAU OF AERONAUTICS. Installation specification for Model ABA-1, airborne IFF equipment as alternate to system number one of AN/APX-1. (NAVAER-EI-140) Jan 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Description of the physical characteristics of the ABA-1 IFF equipment, and gives detail requirements for a satisfactory installation of and provisions for it as an alternate to AN/APX-1 IFF in navy aircraft. Parts list and drawings of the installation and its components are included.

PB 13591. U.S. NAVY DEPARTMENT. BUREAU OF AERONAUTICS. Navy aeronautical specifications. Filter: Antenna network, highpass F-40/APX. (NAVAER M-720.) Jun 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
Specifications for IFF highpass filter, designed primarily for AN/APX-1 and AN/APX-13 equipment to attenuate frequencies lower than IFF frequencies generated by radio equipment. It is inserted in the antenna coaxial cable lead-in. Circuit diagram and assembly drawings included.

PB 13690. U. S. NAVY DEPARTMENT. BUREAU OF AERONAUTICS. Navy aeronautical specification, filter: antenna network, lowpass F-47/APX-13. (NAVAER M724) Jul 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
Specification for an IFF lowpass filter, designed primarily for AN/APX-13 equipment, to attenuate frequencies higher than IFF frequencies generated by radio equipment. This antenna network filter is inserted in the antenna coaxial cable lead-in of the IFF equipment. Drawing included.

PB 13638. U. S. NAVY DEPARTMENT. BUREAU OF AERONAUTICS. Navy aeronautical specification: General specification for radomes. (NAVAER-M-609a) May 1945. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
Radome shall provide protection for the enclosed equipment from wind and weather and shall conceal the enclosed equipment from visual observation. They shall be so constructed to provide long life under severe conditions of service use and shall provide easy access for servicing and repairing the equipment within. Other general characteristics and test specifications are given.

PB 13688. U. S. NAVY DEPARTMENT. BUREAU OF AERONAUTICS. Navy aeronautical specification for AT-130/AP antenna. (NAVAER M-731). Aug 1945. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
Specifications for streamlined sleeve and stub type AT-130/AP antenna especially designed for mounting on military aircraft.

PB 17882. U. S. NAVY DEPARTMENT. BUREAU OF ENGINEERING Installation, operation and maintenance instructions for power training control for use as a part of echo ranging and sound listening equipments. (Manufactured by Submarine Signal Company, Boston, Mass.) (Sub Sig Spec S456) Apr 1939. 65 p. Price: Microfilm - $1.00 - Photostat - $6.00
The power training controls covered by this manual are designed to be used in training the projectors of echo ranging and sonic receiving equipments installed on certain submarines. These controls include a training unit consisting of a d-c motor and reduction gears which directly control projector shaft rotation, a remote control unit, motor-generator, and motor -controller. This handbook provides installation, operation, and maintenance information on this equipment. It includes a detailed parts list, drawings giving installation data, photographs, and wiring diagrams.

PB 17891. U. S. NAVY DEPARTMENT. BUREAU OF ENGINEERING Installing and operating instructions radio direction finder Model DR. (Manufactured by Airplane & Marine Direction Finder Corp., Lindenhurst, N.Y.) Jun 1936. 40 p. Price: Microfilm - 50¢ - Photostat - $3.00
The purpose of this equipment is to provide a portable radio direction finder, covering the frequency range of 200 - 18,000 kilocycles, which is adaptable, without any change, to marine, air station, shore station, or field installation. The following topics are covered in the text-receiver, installation, operation, calibration, maintenance, accessories requiring replacement, spare parts, receiver alignment, parts list, assembly outline, battery box and charging unit drawings, schematic diagram, and photographs.

PB 17432. U. S. NAVY DEPARTMENT. BUREAU OF ENGINEERING, Model DK radio direction finder, frequency range 100 to 1000 kcs. Instruction book. (Manufactured by Westinghouse Electric & Manufacturing Co., Chicopee Falls, Mass.) (I.B. 5675) Jun 1930, modified 1933. 32 p. Price: Microfilm-50¢ - Photostat-$3.00
An instruction manual on the operation and maintenance of the DK radio direction finder, manufactured under a Navy contract dated June 1930. It is of the rotating coil type and is suitable for installation aboard ship or ashore. Drawings, photographs and tables are included.

PB 17431. U. S. NAVY DEPARTMENT. BUREAU OF ENGINEERING, Model DL radio direction finder, frequency range 100 to 1000 kcs., power supply 110 volt 60 cycle single phase. Instruction book. (Manufactured by Westinghouse Electric & Manufacturing Co., Chicopee Falls, Mass.) (I. B. 5676.) Feb 1931, modified 1933. 55 p. Price: Microfilm-$1.5 Photostat-$4.00
The model DL radio direction finder is designed for the purpose of determining the bearings of received signals. It is of the rotating coil type and is suitable for installatio aboard ship or ashore. The equipment consists essentially of (1) Loop, Navy type CAY-3867; (2) indicator and mechanical corrector; (3) receiver, Navy type CAY-4504; and (4) socket power unit. This instruction book covers installation, operation and maintenance and includes parts lists, schematic drawings, photographs, and tables.

PB 17890. U. S. NAVY DEPARTMENT. BUREAU OF ENGINEERING Model DQ-4 radio direction finder equipment. Instructions. (Manufactured by RCA Mfg. Co., Camden, N.J.) (IB-3806) 1940. 65 p. Price: Microfilm - $1.00 - Photostat - $5.00
These instructions cover the installation, operation and servicing of the Direction Finder Equipment specified. This equipment is designed to operate from 110 volt, 60 cycle, single phase service. The receiver is of the superheterodyne type and covers the frequency range of 100 to 1500 kc. When properly installed and calibrated the equipment will accurately indicate the direction of propagation of pure or modulated continuous wave signals, either keyed or unkeyed, at any frequency within this band.

PB 17877. U. S. NAVY DEPARTMENT. BUREAU OF ENGINEERING Model KB-3 sound transmitting equipment, installation, operation and maintenance instructions. (Manufactured by Submarine Signal Company, Boston, Mass.) (Sub. Sig Spec. S517) n.d. 63 p. Price: Microfilm - $1.00 - Photostat - $5.00

The Model KL-3 sound transmitting equipment is a device for communicating between vessels by means of sound waves through the sea water. It may also be used as a source of signals for echo depth sounding, particularly in depths greater than 100 fathoms. This instruction book contains photographs and drawings, including a wiring diagram, a sectional assembly of the motor generator, and a print of the motor starter.

PB 17487. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Handbook of maintenance instructions for radio transmitting equipment RC-156-A (or radar set AN/SPT-2); and Supplement 1 (Navships 900, 281-1B) Nov 1943. 55 p. Price: Microfilm-$1.00 - Photostat-$4.00
Radio equipment RC-156-A is intended for installation and operation in aircraft. Prior to take-off, it is preset to a desired frequency between 480 and 700 mc, so that it can transmit hash to jam enemy radar. The equipment includes a transmitter and a radio control box, which is used when transmitter is in a remote position. Handbook contains instructions on installation, operation, maintenance and adjustment of equipment. Parts lists, photographs, diagrams and schematics are included.

PB 17488. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Handbook of maintenance instructions for transmitting equipment AN/SPT-1; and Supplement 1. (Navships 900, 317-1B) Mar 1944. 67 p. Price: Microfilm-$1.00 - Photostat-$5.00
This airborne transmitting equipment is intended to confuse or obliterate the information which is normally given by enemy radar systems operating in the frequency range from 93 to 210 megacycles. The equipment produces an ultra-high frequency jamming signal of approximately 5 mc band-width which can be set to any desired frequency in the 93 to 210 mc. band. The equipment includes the transmitter, which produces disturbances to jam enemy radar reception, control unit which allows remote control operation and three quarter-wave stub antennas of different lengths. Instruction on installation, operation, adjustment and maintenance of equipment is included. Parts lists, photographs, charts, and schematics illustrate manual.

PB 17898. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Installation, operating and maintenance instructions for Model ML-2 portable supersonic depth recorder. (Manufactured by Bludworth, Inc. New York, N.Y.) (Bludworth B-59) Apr 1942. 60 p. Price: Microfilm - $1.00 - Photostat - $4.00
The equipment is of the portable, recording type, whereby permanent chart records of water depths either below the surface of the water or beneath the keel of a small boat may be obtained. Operation is entirely automatic requiring only the switching on of the power and an occasional adjustment of sensitivity. Three ranges are provided: 0 to 60, 60 to 120, and 120 to 180 feet. The following subjects are covered - description of apparatus, operating, maintenance and installation instructions, service notes, circuit tests, working drawings, tables, drawings, and photographs.

PB 17884. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for model DAK-3 intermediate frequency radio direction finder equipment. (Manufactured by Federal Telephone and Radio Corporation, Newark, N. J.) (Navships 900,264-1B) n.d. 113 p. Price: Microfilm - $1.50 - Photostat - $8.00
The model DAK-3 is an intermediate frequency radio direction finder equipment using a fixed crossed loop and a sense antenna for use on board ship. It covers the frequency range between 250 and 1500 kilocycles. Two methods of bearing determinations are provided: (1) A manually operated goniometer and a two-inch cathode-ray tube in the receiver provide bearing indications by the matched-line method; (2) a second position on the indication switch provides bearings by null methods, both aural and visual. This instruction book covers installation, operation and maintenance, and contains parts lists, tables, photographs and schematic diagrams. The book is not dated, but diagrams and errata sheet are dated 1944.

PB 14784. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for model DU-1 aircraft radio direction finding equipment, frequency range 200 to 1600 kcs. (NAVAER 08-5Q-9.) 1941. 51 p. Price: Microfilm-$1.00 - Photostat-$4.00
DU-1 radio direction finding equipment, manufactured by Bendix Radio Division of Bendix Aviation Corporation of Baltimore, has been designed to take accurate unilateral and bilateral bearings when used in conjunction with Navy radio receiving equipment of the model RU series. It is intended for installation on open cockpit types of Naval aircraft, such as scouting and observation planes, where all operating controls must be accessible to the pilot or observer. It consists of a loop antenna, vacuum tubes, and suitable signal coupling circuits for determining, without ambiguity, the bearing of a radio transmitting station when the equipment is used with a suitable vertical antenna. In addition to a detailed description, this report discusses installation, initial adjustments and calibration, operation and maintenance, and includes parts lists, photographs, schematic and wiring diagrams of the equipment.

PB 15095. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for model DM-1 aircraft radio direction finding equipment, frequency range 200 to 1600 kcs. (NavAer 08-5d-12). 1940. 55 p. Price: Microfilm-$1.00 - Photostat-$4.00
This direction finding equipment, manufactured by the Bendix Radio Corporation of Baltimore, has been designed to take accurate unilateral and bilateral bearings when used in conjunction with Navy radio receiving equipment of the model RU series. It is intended for installation on the larger types of Naval aircraft, such as patrol and transport planes, where the loop may be plugged into a shaft which extends directly up through the skin of the ship from the direction finder coupling unit in the radio compartment. It consists of a loop antenna, vacuum amplifying tubes, and suitable signal coupling circuits for determining, without ambiguity, the bearing of a radio transmitting station when the equipment is used with a suitable vertical antenna. Report gives a detailed description, and directions for installation, initial adjustments and calibration, operation and maintenance, lists of parts and manufacturers, photographs, and descriptive, schematic and wiring diagrams.

PB 14829. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for Navy model ASB-5 aircraft radar equipment. (NAVAER 08-5S-27.) 1942. 228 p. Price: Microfilm-$2.50 - Photostat-$16.00
This manual describes the mechanical and electrical characteristics of the Navy model ASB-5 aircraft radar equipment, and gives information on the installation, operation and maintenance of this equipment. Diagrams, photographs, and tables are included.

PB 17886. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for navy model DAF, radio direction finder equipment. (Manufactured by Garod Radio Corporation, Brooklyn, New York). Feb 1943. 27 p. Price: Microfilm - 50¢ - Photostat - $2.00
The model DAF radio direction finder is designed for use on small naval craft of wooden construction. It is suitable and capable of taking accurate bearings of radio signals with either A1, A2, or A3 emission characteristics. It has a frequency range of 290-550 kc. and consists of two major units: (a) Receiver and (b) Vibrator power unit. This manual gives instructions for installing, operating, and maintaining the equipment. Parts list, photographs, and diagrams are included.

PB 17878. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for navy models JM-1 and JM-3 sono-radio buoy transmitting equipment. (Manufactured by Airplane and Marine Instrument Inc., Clearfield, Pennsylvania) (Navships 900,332-1B) Dec 1942. 125 p. Price: Microfilm - $1.50 - Photostat - $9.00
An instruction book on the installation, operation, and maintenance of the Sono-Radio Buoy. The purpose of this

buoy is to detect underwater sounds produced by moving power-driven water craft, and to transmit these to a shore-side listening station as a warning that a moving craft is present in the waters within range of the buoy. Under normal conditions this equipment can detect the presence of a vessel underway at ranges of approximately 1500 to 2000 yards. A receiver to pick up the signal from the buoy is located on shore, approximately 10 miles from the most distant buoys. Data on the buoys: Output - 6-8 watts; emission-FM; frequency range - 70-90 mcs. Supplementary data in the book include parts lists, vacuum tube characteristics, typical performance characteristics, photographs, drawings, tables, and diagrams.

PB 17896. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for Navy Model MJ-4 echo sounding equipment. (Manufactured by Submarine Signal Co., Boston, Mass.) (Nav Ships 900,431) Feb 1945. 48 p. Price: Microfilm - 50¢ - Photostat - $4.00
A schematic wiring diagram showing the electrical details of all the units included in this manual of instructions for the operation, installation, operating and maintenance of the Model MJ-4 echo sounding equipment. Photographs, tables, and diagrams are included.

PB 17899. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instruction book for sonar sounding equipment Navy Model MJ-7. (Manufactured by Submarine Signal Co., Boston, Mass.) (Nav Ships 900,409) Apr 1945. 89 p. Price: Microfilm - $1.00 - Photostat - $6.00
This equipment measures and records ocean depths in feet or fathoms by producing a supersonic signal in the water and measuring the time elapsing before the return of its echo from the sea bottom. The book contains section on: Description of the apparatus, principles of operation, installation, operation, and maintenance instructions, list of major and spare parts, together with 35 illustration and 10 tables.

PB 15080. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Instructions for Model DZ-2 aircraft radio direction finder equipment. (NavAer 08-5Q-14). 1942. 123 p. Price: Microfilm-$1.50 - Photostat-$9.00
The Model DZ-2 aircraft radio direction finder equipment consists essentially of a rotatable loop antenna, a radio receiver, and a dynamotor-filter. The equipment is intended for installation in all types of Naval heavier-than-air aircraft whose space limitations are such as to permit access for operation of the receiver and loop controls, and which, by absence of closed loops or other obstructions, permit successful direction finding. The equipment is designed for operation from an aircraft's 24-volt battery and serves either for radio reception or for direction finding. The Model DZ-2 equipment differs from the Model DZ-2A, only in respect to the position in which the loop antenna is mounted. Photographs of the unit and components, curves of vacuum tube characteristics, tables and drawings are included. Manufactured by RCA Victor Division of Radio Corporation of America, Camden, N. J.

PB 14808. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Model DZ-2 aircraft radio direction finder equipment frequency range: 15-70 KC and 100-1750 KC, 24 volt direct-current operation. (NAVAER 08-5Q-270) Feb 1943. 148 p. Price: Microfilm-$3.00 - Photostat-$10.00
This equipment consists essentially of a rotatable loop antenna, a radio receiver, and a dynamotor-filter. It was designed for installation in all types of naval heavier-than-air aircraft whose space limitations are such as to permit access for operation of the receiver and loop controls. The equipment may be used either for direction finding or for radio reception in the range from 15 to 1750 KC. The handbook has complete sections on installation, operation, maintenance, and description of the equipment. Parts lists for all components are provided as well as tables of typical meter readings obtained on all parts of the direction finder. Photographs, drawings of parts, and schematic and wiring diagrams are included.

PB 17897. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Preliminary installation, operation and maintenance instructions for Model MJ-8 echo sounding equipment. (Manufactured by Bludworth, Inc., New York, N. Y.) (Bludworth B-76) Mar 1943. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
This manual contains a general description of Model MJ-8 echo sounding equipment, with information for its installation, operation adjustment, and maintenance. Drawings schematics, and service notes are included.

PB 17479. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Preliminary instruction book for Model DAK-1 radio direction finding equipment, frequency range 250 to 1500 kc (manufactured by Federal Telephone and Radio Corporation, Newark, N.J.) (RF-888-IB) Mar 1942. 102 p. Price: Microfilm-$1.50 - Photostat-$7.00
The Model DAK-1 intermediate frequency radio direction finder is a new type of direction finder, using a fixed crossed loop. The equipment is designed and mounted to withstand the effects of vibration, gun-fire shock, pitch and roll ordinarily encountered in naval service. Manual contains the following sections: General description; operating instructions; pattern interpretation; general theory; data on the CAN test oscillator; maintenance; parts list; manufacturer's list; drawings and schematics.

PB 17885. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Preliminary Instruction book for navy model DAV portable homing direction finders. (Manufactured by National Electrical Machine Shops, Washington, D.C.) (RA 69A 223A) Sep 1943. 26 p. Price: Microfilm - 50¢ - Photostat-$2.00
The model DAV-1 radio direction finder is a small, ultra-portable device to permit a paratrooper or others engaged in military operations to obtain an indication of the direction or bearing of a radio transmitting station. It is not intended as a device capable of permitting the obtainment of extremely accurate radio bearings but rather a 'homing' device to enable the wearer to move toward and eventually arrive at the point where a transmitter is operating. It is essentially a short (ground wave) range equipment employing a small shielded loop as a collector. Operation, assembly, and maintenance are described, and there are wiring diagrams and a graph showing effective height of the loop.

PB 15056 U. S. WAR AND NAVY DEPARTMENTS AND AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for aircraft radar training equipment AN/APS-4-T2). (CO-AN 16-30-APS4-2M). 1945. 85 p. Price: Microfilm-$1.00 - Photostat-$6.00
Multiple Indicator Equipment AN/APS-4-T2 is designed to be used in conjunction with Model AN/APS-4 or AN/APS-4A Aircraft Radar Equipment. The purpose of the equipment is to facilitate the training of a group of radar operators in interpreting the indications received on the basic radar equipment. This is accomplished by repeating the indications received on the basic equipment on up to nine additional indicators. Report covers installation and adjustment, operation, and maintenance. Drawings and diagrams.

PB 15052 U. S. WAR AND NAVY DEPARTMENTS AND THE AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for ASB-7/7A, ASB-7/7A/7B (with CPR-46AGJ receiver) aircraft radar equipment. (CO-AN 08-45-6). 1944. 360 p. Price: Microfilm-$2.50 - Photostat-$15
The subject radar equipment is designed for carrier-born aircraft for use in searching for surface objects, detection of other aircraft, and limited navigational use. It is light weight equipment. The handbook covers the installation adjustment, operation, and maintenance of both models with type CPR-46AGJ receiver. It gives a general description of the complete equipment, a discussion of the theory of operation, and other supplementary data as wellas detailed instructions on the component parts. Wiring diagrams, schematic plans, and cable assemblies are illustrated in full.

Photographs and drawings of the various parts are included and there is a list of replaceable parts. A glossary of radio and radar terms and the meaning of each is an additional feature.

16-30 APA 20-3

PB 15093. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for Model AN/APA 20 aircraft radar equipment. (OO-AN-08-30 APA20-2). 1944. 40 p. Price: Microfilm-50¢ - Photostat-$3.00

The Model AN/APA-20 Sector Scan Equipment causes the radar equipment antenna to oscillate back and forth in azimuth over a sector chosen by the operator. The width of this sector may be varied from 10 degrees to 140 degrees and the direction of its mid-point varied through 360 degrees. This equipment is designed for operation with Model AN/APS-2, 2A, 2B, and 2D airborne radar equipment in medium and heavy bombers, patrol planes, and lighter-than-air craft. Report discusses installation, adjustment, operation, and maintenance of this equipment. Drawings and photographs.

PB 15065. U. S. WAR DEPARTMENT, U. S. NAVY DEPARTMENT and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for model AN/APA-24 direction finder antenna system. (AN 16-30APA24-2). 1945. 101 p. Price: Microfilm-$1.50 - Photostat-$7.00

This manual gives information on the installation, operation, adjustment and maintenance of airborne finder antenna system. Graphs, photographs, diagrams, and tables are numerous.

16-30APA26-3

PB 15069. U. S. WAR and NAVY DEPARTMENT and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for AN/APA-26 aircraft radar equipment. (OO-AN-08-30APA26-2). 1945. 55 p. Price: Microfilm-$1.00 - Photostat-$4.00

This is a revised and enlarged edition of an earlier manual on the same equipment. (See PB 15083). It includes additional information covering maintenance, theory of operation, a table of replaceable parts, and many more photographs of the equipment.

PB 14849 U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for model AN/ART-2 equipment. (OO-AN 08-30ART2-2) Jan 1946. 95 p. Price: Microfilm-$1.00 - Photostat-$7.00

The model AN/ART-2 airborne special radio equipment is a transmitter designed to produce a barrage jamming signal about 400 KC wide at any pre-set point in the range of 21 to 50 MC. This handbook contains a general description, installation and adjustment instructions, operating instructions, the mechanical and electrical characteristics, and maintenance instructions for the equipment. Schematics, wiring diagrams, drawings, parts lists, and illustrations are included.

PB 14806. U. S. WAR and NAVY DEPARTMENT. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for model ASB-8 aircraft radar equipment. (NAVAER-08-35-100.) 1944. 164 p. Price: Microfilm-$2.00 - Photostat-$11.00

The Navy model ASB-8 aircraft radar equipment serves the same purpose, operates on the same theory and with the same power requirements as set forth in the instruction book for Navy model ASB-4 aircraft radar equipment. This manual, therefore, concerns itself only with a description of the new units, and refers to the model ASB-4 manual for information about equipment that is used in both models. Information for the CAY-45ACE radar receiver is found at the end of this manual. Diagrams, tables, and photographs are included.

PB 14804. U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for model NAF 69245-1A aircraft radio selector unit. (AN 08-45-20.) 1944. 39 p. Price: Microfilm-50¢ Photostat-$3.00

The selector unit is part of an equipment used by the Navy for target control. Its function is to close ten circuits either individually or as many as three simultaneously. This manual supplies information on the installation, adjustment, operation and maintenance of the equipment, and includes tables and drawings.

PB 14785. U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for Models AN/APA-17 and AN/APA-17A aircraft radar equipment. (AN 08-30APA17-2X.) 1945. 430 p. Price: Microfilm-$4.50 - Photostat-$29.00

This title is composed of two handbooks, one devoted to information on Model AN/APA-17 aircraft radar equipment and the other to information on Model AN/APA-17A aircraft radar equipment. The handbook for each model includes information on the installation, adjustment, operation and maintenance, of the equipment, with schematic drawings, diagrams, photographs, and tables.

AN 26-20E-2

PB 15098. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for multiple indicator equipment AN/APS-15-T1. (OO-AN-08-30APS15-4-T). 1944. 84 p. Price: Microfilm-$1.00 - Photostat-$6.00

Multiple indicator equipment AN/APS-15-T1 is designed to be used in conjunction with Model AN/APS-15 series aircraft radar equipment. The purpose of the equipment is to facilitate the training of a group of radar operators in interpreting the indications received on the basic radar equipment. This is accomplished by repeating the indications received on the basic equipment on groups of four plan repeater indicators. The multiple indicator equipment is required to provide the additions (power and signal amplifiers necessary. Installation, operating and maintenance instructions are given. Numerous drawings.

PB 15076. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for Navy type CPR-56ADO repeater indicator equipment. (Navy Dept. ANVAER 08-58-14). 1944. 89 p. Price: Microfilm-$1.00 - Photostat-$6.00

Repeater indicator CPR-56ADO equipment serves as an optional remote indicating system in conjunction with any model of ASB aircraft radar equipment. Repeater indicator equipment gives an accurate indication of the results obtained by the ASB equipment in locating objects from an aircraft. Principles of operation are explained as well as the electrical characteristics. A trouble localization chart, table of vacuum tubes used wiring and schematic diagrams, drawings and photographs are included.

PB 14807. U.S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for radar indicator assembly AN/APA-11. (AN 16-30 APA-11-3.) 1945. 75 p. Price: Microfilm-$1.00- Photostat-$5.00

This radar indicator assembly is designed for airborne use to assist in the identification and location of radar installations which operate on a pulse repetition frequency between 200 and 6000 cycles per second. This equipment operates when supplied with either a positive or negative pulsed signal. It is a pulse analyzer with three modes of operation. Two modes permit the analyzing and identifying pulses. The third allows the equipment to be used as an ordinary cathode-ray oscilloscope. The handbook covers installation and adjustment, operation and maintenance. There is a parts catalog. The handbook is illustrated with drawings and diagrams.

PB 14782. U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for radar set AN/APT-2 or radio transmitting equipment RO-156-A. (AN 16-30 APT2-3) May 1945. 62 p. Price: Microfilm-$1.00 - Photostat-$5.00

Radar set AN/APT-2 is an airborne jamming equipment designed to confuse or obliterate the information presented by enemy radar equipment operating in the frequency range of 450 to 710 megacycles. The equipment produces a noise-modulated, ultra-high-frequency signal approximately 7 megacycles in width, although the part of this broad signal that produces effective jamming is about 4 megacycles. It is amplitude modulated and has a power output of 3 to 7 watts, depending on the frequency. The equipment operates from the aircraft power source of either 75 to 85 volts or 105 to 125 volts at frequencies between 400 and 2600 cycles per second. Approximately 200 watts of power are needed for proper operation. In addition, one ampere at 27.5 volts d-c is required for the blower. Photographs of the assembly and of its components, schematic and functional diagrams, parts list and installation drawings are included.

PB 15114. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for radar set AN/APT-4. (CO-AN 16-30APT4-3M). 1945. 102 p. Price: Microfilm-$1.50 - Photostat-$7.00
Radar set AN/APT-4 is an airborne equipment designed for jamming enemy radar or other radio equipment. It is operated by front panel controls only. Wide or narrow band may be used depending on the type of coverage desired (barrage or spot jamming). The equipment consists of a radar transmitter which emits a noise modulated signal, a modulator, a power rectifier unit, two antenna assemblies, shock mountings, and connectors. Report contains sections on installation and adjustment, operation, theory of operation, maintenance, table of replaceable parts, and drawings.

PB 15119. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for radio receiving set AN/ARR-7. (AN 16-30ARR7-2). 1945. 74 p. Price: Microfilm-$1.00 - Photostat-$5.00
Radio receiving set AN/ARR-7 is an airborne search receiver designed to locate radio frequency channels of radar and communications signals. No provision is made for remote control of the receiver. It consists of radio receiver R-45/ARR-7 and rectifier power unit PP-32/AR, together with the necessary mounting bases, connecting cables, and accessories. Manual contains instructions on installation, adjustment, operation, theory of operation, and maintenance. There is a parts catalog. Photographs and drawings.

PB 14792. U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for radio compass AN/ARN-7. (AN 16-30ARN 7-3) Aug 1945. 216 p. Price: Microfilm-$2.50 - Photostat-$15.00
Radio compass AN/ARN-7 is designed primarily to be used as an aircraft-navigational instrument. Basically, the equipment is a radio receiver using a superheterodyne circuit and certain additional circuits necessary for radio compass operation. Two remote controls permit operation of the compass from either of two separate positions on the aircraft. The equipment has a frequency range of 100 to 1750 kc in four bands. The radio compass provides visual and aural indication of the direction of arrival of radio signals. It may also be used for the reception of modulated or CW radio signals using either a non-directional or a loop antenna.
This handbook gives a comprehensive description of the characteristics and use of the equipment including an 89-page section on its maintenance. The handbook is profusely illustrated with photographs, drawings, cutaway views, schematics, and wiring diagrams. It contains numerous tables and charts giving typical voltage and resistance readings of all parts of the equipment as well as other maintenance data and parts lists.

PB 15111. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for radio set AN/ARQ-8. (CO-AN 16-30ARQ 8-4-M). 1945. 153 p. Price: Microfilm-$2.00 - Photostat-$11.00
Radio set AN/ARQ-8 is an airborne radio transmitting and receiving set which provides a noise-modulated signal for jamming enemy radio communications and radar systems. The [illegible] source is either a multiplier photo tube and its associated wide-band preamplifier or a gas triode and its associated narrow-band pre-amplifier. A tunable oscillator stage, which feeds both the transmitter and the receiver mixer, furnishes the proper r-f voltage for setting the operating frequency within the range of 25 to 105 megacycles. Handbook gives maintenance and operating instructions. A list of replaceable parts is given, and there are numerous tables and illustrations.

PB 15062. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for radio transmitting equipment AN/CRM-1. (AN 08-30CRM-1) 1944. 50 p. Price: Microfilm-50¢ - Photostat-$4.00
Radio transmitting equipment AN/CRM-1 is a single tube, battery-powered, low-frequency, buoy transmitter. The equipment is designed to be launched into the water from a military aircraft of the bombardment type. A six-foot baseball-type parachute is used to lower the equipment safely from the aircraft to the water. The equipment provides for automatic transmission of a predetermined signal suitable for homing purposes by U. S. Army aircraft equipped with an automatic radio compass. Instructions for operation and maintenance are given. Drawings.

PB 15116. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for receiving equipment AN/APR-4. (AN 08-30APR4-3). 1945. 300 p. Price: Microfilm-$3.00 - Photostat-$20.00
Radio set AN/APN-4 is airborne navigational equipment used to determine the geographic position of the aircraft in which it is installed. This set is part of the Loran system of navigation. Report contains instructions for installation and adjustment, operation, theory of operation, and maintenance. There are a parts catalog and supplementary data. Numerous photographs, drawings, tables, and diagrams.

PB 14793. U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for transmitting equipment AN/APT-1. (CO-AN 16-30 APT1-2M) 1945. 85 p. Price: Microfilm-$1.00 - Photostat-$6.00
This document gives a detailed description of the airborne jamming transmitter AN/APT-1 operating on the frequency range of from 93 to 210 mc, its parts and equipment, and instructions for its installation, adjustment, operation and maintenance.

PB 17489. U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for transmitting equipment AN/APT-4, and Supplement No. 1. (NAVSHIPS 900, 282-IB) Jan 1944. 44 p. Price: Microfilm-50¢ - Photostat-$3.00
This airborne transmitting equipment is intended to confuse or obliterate the information presented by enemy radar equipment operating in the frequency range 200 to 550 mc. The equipment produces an ultra-high-frequency carrier which is amplitude modulated by a "hash" or noise signal. The modulation signal has components extending 100 kc to 3.5 mc. The equipment includes a rectifier power unit, mountings, radio transmitter and antenna assembly. The manual gives instruction on installation, operation, maintenance and adjustment. Parts lists, photographs, diagram drawings and schematics are included.

PB 14825. U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of maintenance instructions for type TMX-4DX absorbing pyramid. (CO-AN 08-45-5) Aug 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
Absorbing pyramid, also known as a "power absorption cone" is for use in coupling echo boxes, signal generators or power meters to radar systems. This pyramid prevents serious reflections from very close objects "pulling" the transmitter frequency, that is, changing its frequency and power from that which is obtained with no reflection. It also reduces the great number of echoes often encountered from nearby targets which may interfere with the tests. Includes photographs.

PB 14801. U. S. WAR and NAVY DEPARTMENT. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating and maintenance instruction for AN/APA-30. (CO-NAVAER 16-65-519.) n.d. 74 p. Price: Microfilm-$1.00 - Photostat-$5.00
This handbook gives information on the installation, operation, adjustment, and maintenance of the AN/APA-30, a ranging and tracking attachment for any airborne pulse radar set. Test equipment, tables of voltages, resistances, waveforms, and zero corrections in mils for rocket firing from a TBF or TBM airplane, a table of replacable parts, list of manufacturers, and diagrammatic sketches and photographs are included.

PB 14790. U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating and maintenance instructions for HD-5/APS-20 blower. (NAVAER 16-65-506.) 1945. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
This portable, electrically-driven centrifugal blower is used to supply forced-draft ventilation to the MD-53/APS-20 modulator when it is desired to operate the modulaotr with the aircraft not in flight. The equipment then provides the necessary flow of air to the air-scoop to replace that ordinarily caused by flight.

PB 14779. U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating and maintenance instructions for Model AN/APA-8 radar booster-amplifier assembly. (CO-NAVAER-08-65-124.) 1944. 41 p. Price: Microfilm-50¢ - Photostat-$3.00
This handbook gives information on the installation, adjustment, operation and maintenance of Model AN/APA-8 radar booster-amplifier assembly, designed for use with the AN/APS-2A series airborne radar equipment. Charts, tables, photographs and diagrams are included.

PB 15063. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for AN/APA-26 radar R.F. attenuator assembly. (AN 08-30APA 26-2). 1944. 32 p. Price: Microfilm-50¢ - Photostat-$3.00
The function of this equipment is to attenuate the strength of radar signals sent out by AN/APS-2 radar equipment when, and if required. This handbook gives a general description of the equipment and information relative to its installation, adjustment, operation, and emergency repair. Photographs and drawings of the component parts and assemblies are included.

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PB 15064. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for AN/APA-22 radar r.f. attenuator assembly. (AN 08-30-APA22-2). 1944. 31 p. Price: Microfilm-50¢ - Photostat-$3.00
R. F. attenuator assembly AN/APA-22 is designed for use with installations of AN/APA-2 series radar equipment. It is suitable for AN/APA-2B, -2C, -2E, and -2F equipment in installations which have transmitter converter mounted above antenna assembly. This handbook contains information necessary to the installation, adjustment and operation of this attenuator equipment. Drawings and diagrams.

PB 15053 U. S. WAR AND NAVY DEPARTMENTS AND AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for aircraft, radar equipment AN/APG-17. (AN 16-30APG17-3). 1945. 36 p. Price: Microfilm-50¢ - Photostat-$3.00
The information in this handbook covers the installation, operation, and emergency repair of aircraft radar equipment AN/APG-17. This equipment is an automatic bomb release device which determines the exact time to drop a bomb from an aircraft so that it will strike an isolated or semi-isolated marine surface vessel. The equipment is similar in basic theory and operation to its predecessor, radio set AN/APG-4. Tables and diagrams

PB 14228. U. S. WAR and NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for ASB-7/7A, ASB-7/7A/7B (with CPR-46 ACJ receiver) aircraft radar equipment (AN 08-45-14.) 1944. 57 p. Price: Microfilm-$1.00 - Photostat-$4.00
This handbook covers the installation and operation of ASB-7/7A and ASB-7/7A/7B radar equipments with the CPR-46 ACJ receiver. This book does not cover the ASB-7 equipments, and does not replace any other publication in the ASB series. The handbook does not explain the theory of operation, the installation of the antennas or the maintenance of the equipment. There is a short section on emergency operation and repair. Diagrams and illustrations.

PB 15057 U. S. WAR AND NAVY DEPARTMENTS. AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for model AN/APS-3A aircraft radar equipment. (AN 08-30APS3-2). 1945. 56 p. Price: Microfilm-$1.00 - Photostat-$4.00
Information in this manual deals with installation, operation, and emergency repair of the subject equipment. Another handbook (CO-AN 08-30APS3-3-I) covers the theory of operation and maintenance, and gives schematic diagrams of the same equipment. The major units include modulator, antenna, pressurizing unit, transmitter-converter, receiver-amplifier, repeater-indicators, milliammeter, control unit, rectifier unit, azimuth calibrator, dummy indicator, and visor. There are photographs and outline drawings of the component parts as well as data and drawings on cable fabrication.

PB 15094. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for radio receiving equipments AN/ARN-5 and AN/ARN-5A. (AN 08-30ARN5-2). 1944. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Operating instructions for airborne equipment designed to give vertical guidance to a pilot during aircraft landing operations. This equipment is part of a navigational system which provides both lateral and vertical guidance, lateral guidance being supplied by radio receiving equipment RC-103-A. Tables and figures.

PB 15097. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for radio sets AN/APG-4 and AN/APG-4A. (CO-AN 08-30APG-4-2). 1944. 39 p. Price: Microfilm-50¢ - Photostat-$3.00
A manual giving instructions for installation and adjustment, operation, emergency operation and repair of radio sets AN/APG-4 and AN/APG-4X. These equipments are designed for installation in heavier-than-air aircraft, are identical in function, and operate at the same altitudes. They are used to effect the automatic release of a missile from a preset altitude, when the aircraft is directed toward an isolated or semi-isolated marine surface vessel. When flown at the correct pre-set altitude, the equipments evaluate the slant distance to the target, and the relative speed between the aircraft and the target, so as to cause automatic release of a missile at the proper instant. Illustrations.

PB 15124. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for radar set AN/APG-13A. (AN 08-30APG13-2). 1944. 27 p. Price: Microfilm-50¢ - Photostat-$2.00
Radar set AN/APG-13A is airborne equipment designed to furnish target range information to the pilot. The radar operator does this by turning the crank at such a speed as to keep the range step in coincidence with the target pip moves from right to left across the indicator screen. The pilot's duties are thus simplified to merely holding the sight reticule exactly on the target. Installation, adjustment and operating instructions are given. Illustrated.

PB 15123. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for radio set AN/APG-5. (AN 16-30APG5-2). 1945. 27 p. Price: Microfilm-50¢ - Photostat-$2.00
Radio set AN/APG-5 is an airborne, automatic, range-determining device used in connection with computing type sights. Report contains instructions for installation and operation, together with tables and illustrations.

PB 15110. U. S. WAR and NAVY DEPARTMENTS and AIR COUNCIL OF THE UNITED KINGDOM. Handbook of operating instructions for radio set AN/APS-13. (AN 08-30APS13-2). 1944. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
Radio set AN/APS-13 is a complete light weight radar system for installation in aircraft. The equipment provides a visible and an audible warning to the aircraft pilot or other observer of the presence, or of the approach of other aircraft from behind. An indicator consisting of a pilot light, and a warning bell give warning the personnel of the plane. Installation, adjustment, and operation of the set are described. Illustrated.

PB 13008. U. S. WAR DEPARTMENT. SIGNAL CORPS. Electron tube 5J30. (Signal Corps tentative specification 71-2238) Jul 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This specification describes tests to be performed on electron tube 5J30 and ratings to be obtained from them.

PB 13275. VINEYARD, G. H. Effect of the tuning plunger on operation of 2K 33 type tubes. (Radiation Lab Rept 942). Jan 1946. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
The relation between the r-f admittance at the gap in 2K 33 type oscillators and the admittance presented by the output load and tuning plunger is considered, and reduced to that of a general four terminal network. This has a simple graphical representation, which is developed. By means of four parameters easily determined by experiment, the effects on output power and frequency of all possible external loads and plunger positions can be predicted. Theory is compared with experiment, and reasonable agreement is found. Diagrams and graphs are included in the text.

PB 14142. WADEY, W. G. AN/APR6 installation information as of February 19, 1944. (Harvard Univ Radio Res Lab Tech Memo 411-TM-71) Feb 1944. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
This memorandum is intended to report the status of the information gathered and the equipment developed in connection with the waveguide installations for the AN/APR 6 microwave receiver to date (Feb. 1944). Three solid waveguides have been found satisfactory. A neoprene covered flexible waveguide has been developed which is expected to be satisfactory. Twists and bends, flanges, tapered sections, T sections, antennas, and installation are subject material covered together with a 7-page bibliography and 2 photographs.

PB 14045. WADEY, W. G. 5 to 10 CM search antennas for naval installations of the AN/APR-5A receiver. (Harvard University, Radio Research Laboratory. Technical Memorandum 411-TM-143). 1944. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The R-1022 and R-1004 antennas have been developed for use as search antennas aboard naval vessels for searching in the 5 to 10 cm range with the AN/APR-5A receiver. The R-1022 is for vertically polarized waves and the R-1004 for horizontally polarized waves. The pattern of each in the horizontal plane is broad and has a single null. This is the desired pattern for this application since the top of the mast is not available and the antenna will be installed on either the forward or aft side of the mast, at or below the level of the yardarm.

PB 14137. WEBSTER, H. R., and STEPHENSON, J. G. Notes on the wide band modulation of coaxial line oscillators using lighthouse triodes. (Harvard Univ Radio Res Lab Tech Memo 411-TM-65) Mar 1944 27 p. Price: Microfilm-50¢ - Photostat-$2.00
This report is the result of an investigation to verify earlier work in the field and offers a provisional explanation of the verified results. Evidence is presented which shows that the most serious limitation to wide band modulation of coaxial cavity oscillators is the high effective Q of the loaded output cavity. A number of factors influence this effective Q, including the characteristic impedance and number of resonant quarter wavelengths in the coaxial tank circuit, and the dynamic impedance of the oscillator tube. Non-linear low-level grid or cathode modulation appears capable of producing approximately the same modulation bandwidth as plate modulation alone, but at the expense of reduced power output. A combination of plate and in-phase grid, or out-of-phase cathode modulation can produce modulation bandwidths from 75 to 100 percent greater than those obtained by plate modulation alone. The report is illustrated with schematics and graphs.

PB 14305. WEBNER, R. S. Antenna for horizontal polarization at UHF. (OSRD Report 895-29). 1944. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
A simple coax-fed V-dipole antenna intended for use on aircraft for horizontal polarization at ultra-high frequencies is described. Impedance and pattern data indicating the antenna to be useful over frequency bands approximately 25 percent wide are presented. A detail assembly drawing of one of a series of four such antennas, covering a combined range of 800-1500 Mc, is included. Work done at Rocky Point, N. Y., by Radio Corporation of America.

PB 14292. WEBNER, R. S. Broad-band inverted-L antenna. (OSRD Report 895-24). 1944. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
An inverted-L antenna may be modified in such a way as to combine the features of small vertical height (one-sixth to one-eighth of the resonant wave-length) and impedance characteristics which can be conveniently matched to a 50-ohm line over frequency bands approaching sixty percent in width. The antenna is believed to be practical for use on aircraft at frequencies less than 150 Mc. Work done by Radio Corporation of America at Rocky Point, N.Y. Graphs included.

PB 14308. WEBNER, R. S. Design charts for synthesis of two-element broad-band matching sections. (OSRD Report 895-33). 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
A graphical method is described for rapid determination of the parameters of a two-element line-section circuit for matching an antenna to a transmission line over a wide range of frequencies. The method applies to the problem of matching, to less than 2:1 SWR on a 50-ohm line, a series resonant antenna of resonant resistance more than 25 ohms by means of an L-type circuit consisting of an anti-resonant line section connected in shunt with the antenna terminals and a series-transformer line-section connecting the antenna terminals to the output terminals of the main 50-ohm transmission line. The two line sections are assumed to be lossless. Charts yield information as follows: Frequency limits of the widest band over which the given antenna can possibly be matched by this type of circuit, optimum characteristic impedance of the series and shunt sections, and optimum electrical length of the shunt section. Work done at Rocky Point, N. Y., by Radio Corporation of America.

PB 14311. WEBNER, R. S. A zero-drag aircraft antenna for UHF. (OSRD Rept, 895-36.) 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes a sleeve antenna mounted axially in a semi-cylindrical cavity recessed into the skin of a plane, thus leaving no aerodynamic drag. Its electrical properties make it suitable for many applications, using either vertical or horizontal polarization. It is small enough to be practical at frequencies over 300 mc.

PB 14170 WHITE, W. D. Broad-band tests of AN/APT-4 (Xa-2) transmitter in the Wurzburg radar band. (Harvard Univ. Radio Res Lab Rept 411-108). 1944. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
This report covers a series of tests made to determine the feasibility of operating the AN/APT-4 transmitter in such a manner as to provide an extremely wide jamming barrage against German Wurzburg radar systems. Wide bandwidths were achieved by overcoupling the transmitter considerably beyond the point of maximum output. Although this results in some loss of power, the bandwidth for low energy levels is increased. Graphs and a block diagram included in report.

Generators, motors, transmission, distribution and allied equipment

German

PB 15191. JENSEN, OTTO. Report on high voltage switch gear; supplementary material. 1934-45. 368 p. Price: Microfilm-$4.00 - Photostat-$25.00
A collection of drawings, plans, and miscellaneous literature on German high voltage circuit breakers to accompany PB 3477, "Report on high voltage switch gear" (abstracted on p. 264 of this bibliography). Most of the material consists of detailed scale drawings of equipment made by Voigt and Haeffner A. G. There are two descriptive booklets of this firm's equipment (one in English). The remainder of the material consists of sales literature of E. Neumann Hochspannungs - Apparate G.m.b.H., and Asea (a Swedish firm, and a descriptive pamphlet (in German) of the plant and organization Siemens-Schuckertwerke A.G.

PB 21961. ODARENKO, T. M. Selenium rectifier development in Germany. (JIOA Rept 56) Dec 1945. 47 p. Price: Microfilm - 50¢ - Photostat - $4.00
This report reviews American investigations of selenium rectifier development in Germany and presents a German report and additional previously unpublished information on this subject. A number of published reports are cited and the location of pertinent but unpublished reports is given. The report contains information obtained thru interview, on selenium rectifier manufacturing processes at SAF and AEG in Germany. A translation of a report by R. Brill and H. Krebs on X-ray structure-analysis of selenium rectifiers is appended but lacks a page of the text, and the drawings which accompanied the original report. Also appended are two graphs, and a photostat of an untranslated short report by Brill and Krebs containing three drawings.

PB 16664. SCHOLZ, HERBERT J. and WAGNER, CHARLES F. Summary report on investigation of electric power practice in Germany. 1945. 16 p. Price: Mimeograph-25¢
An attempt to uncover what might be new in German technique and practice in the electric power field through personal inspection of plants and interviews with informed German engineers. Little or no advance has been discovered over that which had been known regarding German technique as of 1939. Design and practice was affected by the necessity of operating under war conditions. Perhaps the outstanding differences and developments are: (1) the general use of the Petersen coil on 110 and 220 Kv. circuits; (2) the almost universal use of the air and low-oil instead of the conventional oil circuit breaker; (3) the projection and design of a 400 Kv. A.C. transmission system with its associated apparatus; and (4) the projection and design of a 400 Kv. D.C. Transmission line to be operated on an experimental basis over underground cables for a distance of about 160 Km (100). Report contains summaries on the following topics: Turbo-generators; transformers; circuit breakers; short circuit protection; electric drives for power plant auxiliaries; station design; transmission line construction; lightning protection line performance; system stability and operation; and transmission. (Exhibits mentioned in text are not included in this copy).

PB 11477. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Engineer Board Letter report, German spark plugs and diesel glow plugs. 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Report of an inspection of a number of spark plugs manufactured by several firms and of four sizes of Diesel glow plugs manufactured by Robert Bosch of Stuttgart, Germany. Several of the spark plugs have removable center electrodes which is now a relatively uncommon practice in the United States, also the length of the center insulators indicates a wide heat range is available in the plugs examined. The glow plugs are similar in construction and workmanship to glow plugs used in some less modern Diesel engines. The spark plugs and Diesel glow plugs appear to be the equivalent of, but not superior to plugs manufactured in the United States. Two photographs.

PB 15451. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Evaluation report on captured German engine, generator set. (Reg 2450) Mar 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The subject item consists of a horizontal one-cylinder German gasoline engine belted to a French direct current generator rated at 110 volts, 100 amperes and 1700 RPM. No unusual features were used on the German engine generator set, and no novel uses were made of unusual materials. Photograph is included.

PB 15474. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Evaluation report on German control switch. (Reg 2495) Apr 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The subject equipment is a waterproof switch, containing a momentary make and a momentary break contact, operated by a handle. The unusual features are the use of oil in the switch and the use of silver on the break but not on the make contact. Photograph is included.

PB 15473. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Evaluation report on German magnetic oil switch, R908W-18A. (Reg 2494) Apr 1945. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
The subject equipment is a three phase motor starting switch, equipped with thermal elements, and made by the Siemens Schuckert Company, Berlin. The thermal elements can be set to operate in the range from 0.8 ampere to 1.0 ampere. They are interchangeable, and should be set to the rated current of the motor. Photographs are included.

PB 15471. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Evaluation report on German thermostatic switch. (Reg 2492) Apr 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
The subject equipment is a thermostatic switch, consisting of an adjustable contact, actuated by the difference in expansion of two metallic strips of different materials. The switch apparently is entirely surrounded by the medium by which it is operated. There is no indication of what this medium was nor is any use known to which the switch could be put by American troops. Photograph is included.

PB 13469. U. S. WAR DEPARTMENT. CORPS OF ENGINEER. ENGINEER BOARD. German magnetic oil switch FMS 2511106, German. (Reg 2959) Oct 1945. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Captured German three-phase, oil immersed, electronmagnet relay switch was apparently used for motor starting. Switch contacts are rated at 500 volts and 25 amperes, and solenoid coil and control relay coil are rated are rated at 380 volts and 50 cycles. The switch is provided with both thermal and magnetic action circuit protection; the first by use of a bi-metal; the second by magnetic action. Contacts of heavy unplated copper are of the wiping type and operate in oil. The unit weighs 21 pounds. Unusual features are the use of insulating oil, thermal element operating time adjustment, and the self-contained start-stop buttons. Two photographs and a load-time operating characteristics curve of each of the three bi-metals are appended.

United States

PB 15211. BALLANTINE, STUART and OSTERLAND, EDMUND. Use of transformer coupling with gas-tube noise sources. (OSRD Div of Radio Coordination Rept 1176-2) Jun 1944. 18 p. Price: Microfilm-50¢ - Photostat-$2.00
Noise generator circuits are described in which increased noise output is obtained by substitution of transformer coupling networks for conventional direct resistance coupling. These circuits are best used at lower frequencies and in cases where the load impedance differs greatly from the internal impedance of the noise tube. The report discusses circuits involving both type 884 and type 2050 tubes. Use of the 884 tube is not recommended because of a lack of

the uniform characteristics found in the 2050 type. Schematic drawings of three circuits using 2050 tubes and designed for operation on a standard aircraft 28-volt DC source are presented, together with parts lists for each.

PB 10132. DEMGAN, T. C. Regulator, Generator voltage. Delco-Remy Part No. 1118401. Aug. 1, 1942. (Army Air Forces. EXP-M-54-656-290MM). 1942. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Report of a conference held at the Delco-Remy plant at Anderson, Indiana, to discuss the problems of the carbon pile regulator in production. As a result of the conference action was intended to improve the regulator in several ways and it was recommended that the majority of the regulators be issued out to selected air fields from which performance records would be reported.

PB 16496. FINISON, H. J. Brush wear conference at Westinghouse Electrical and Mfg. Company, 8 April 1943. (Army Air Forces. Engineering Division. ENG-M-54-656-613 G). 1943. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Conference on brush wear research being carried on by Westinghouse including (1) reducing amount of Wa treatment in the brush (2) Air flow checks to improve cooling (3) treatment of metal-graphite brushes (4) research on new ship ring sealed in a glass housing. Altitude tests at Westinghouse utilizes a slip ring sealed in a glass housing. A pressure corresponding to 40,000 feet is used for tests, further altitude tests in an actual generator are conducted in an altitude chamber at the Bureau of Standards.

PB 16515. GREEN, W. M. Tests of resubmitted Leland 250-Volt Ampere Inverter, PE-109-B, for Aircraft Radio Laboratory. (Army Air Forces. Expt. Eng. Sect. EXP-M-54-656-541 C). Jul 1942. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
Laboratory tests on 250 volt ampere inverter with 12 volt input required for operation of the automatic radio compass on C-47 and similar airplanes employing 12 volt d.c. power systems. Sample was rejected on the basis of bad commutation; voltage regulation is excessively high; failure to deliver full load, frequency regulation is too high; and mechanical construction and design are not suitable for proper inverter life. Two curves and a table give results of testing.

PB 10135. LUSK, R. J. Acceptance tests of Electric Auto-Lite Co. 200A. generator control switch. Sept. 12, 1942. (AAF. Eng Div EXP-M-54-656-290 SS). 1942. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Tests showed that the subject generator control switch does not meet U.S. Army Specification No. 94-32278 in regard to mounting by use only of the specified mounting holes. It is also very sensitive to reverse currents of small magnitude of about the order of two or three amperes making it unsuitable for use in an airplane circuits.

PB 10146. LUSK, R. J. Generator voltage regulator, Westinghouse, part numbers 1248275 and 1248275-A. April 10, 1943. (Army Air Forces. Eng Div ENG-M-54-656-290 AD). Apr 10, 1943. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Report of a visit to the Westinghouse Electric and Manufacturing Plant at Lima, Ohio, April 5, 1943 when discussions took place on the following subjects: tests made by Westinghouse to determine the ability of production regulators to meet the resistance range requirements of U.S. Army Specification 94-32276, modification of the test stands for determining minimum resistance, and the development of a differential voltage type generator control switch by Westinghouse. It was recommended that the shipping of silverstat assemblies as spare parts be discontinued since the adjustment required after the regulator assembly is completed is difficult and should not be attempted by relatively inexperienced personnel.

PB 10136. LUSK, R. J. Switch, generator control, Part No. DL-36TR72C1, manufactured by General Electric Company. Nov. 19, 1942. (AAF. Eng Div EXP-M-54-656-290 KKK). Nov 1942. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The subject relays are the second of this model submitted for approval. Acceptance tests showed that the second [illegible] had been improved with respect to physical protection [illegible] rough handling and is satisfactorily protected and that [illegible] tion of pick-up voltage due to temperature variations and [illegible] brations had been diminished. It was recommended that [illegible] duction be expedited.

PB 15021. MASSACHUSETTS INSTITUTE OF TECHNOLOGY. RADIATION LABORATORY. Tentative operating instruction M.I.T. Rad.Lab. modified type 102-A test set (type 102A-1). (Rept M-123) 1943. 10 p. Price: Microfilm-50¢. Photostat-$1.00
The Type 102A-1 test set is designed for use in testing radar systems in field and at installation and repair depots. This report gives a description of the circuits and information on the operation of the set. A photograph and a diagram are appended.

PB 10134. MOORE, C. R. Operating difficulties with electrical equipment. Sept. 19, 1942. (Army Air Forces. EXP-M-54-656-290WW). 1942. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a report of an investigation of electrical operating difficulties at Middletown Air Depot, Middletown, Pennsylvania, in September 1942. Many of the workers were new to this type of work, but the foremen, inspectors, etc., were competent. It was concluded that the difficulties with electrical equipment were due more to the equipment than to personnel.

PB 16561. PARK, J. J. Control system, course indicator for targets. (Army Air Forces. Eng Div TSEPE-665-102). Feb 1946. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Study project to try to find a control system that would enable the remote control operator to set the target on any compass course and know at all times its correct heading. Gyro mechanism attached to a pulsed motor and a remote indicating magnetic compass were tried. Project is being closed as there is no need for water borne targets. If it is reopened, a suitable gyro or compass with negligible drift, 360 degree rotation, and preferrably electric must be found.

PB 16559. PARK, J. J. Water borne target, Type A-4A. (Army Air Forces. Eng Div TSEPE-665-106). Feb 1946. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Project to develop, install and test remote control system for a 200 foot experimental target boat to provide maximum flexibility of control. Functions to be controlled are: Right, left, fast and slow of starboard and port engines; forward and reverse of starboard and port propeller pitch; and the fuel cut-off. Remote visual reading of all instruments is desired. Radio and television equipment include television transmitter AN/AXT-2 and radio receiver RC-64 in the target, and in the control plane. An auxiliary power plant, type D-2 was the power source for the control system. Project was terminated due to obsolescence.

PB 10137. PODHORZER, EMIL. Voltage regulators. Dec. 19, 1942. (AAF. Eng Div ENG-M-54-656-290 NNN). Dec 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Report of tests made to determine stability of voltage regulation of voltage regulators made by Westinghouse General Electric and Delco-Remy plants. The tests indicated that wide variations in output voltage will occur during airplane maneuvers. The variations in the regulated voltage are produced wherever the armature or piston is acted upon by its own weight in such a direction as to add to or detract from the movement normally produced by the action of the magnetic forces.

PB 16502. TOLENTINO, J. O. Test on switch for type [illegible] portable floodlight. (Army Air Forces. Eng Div ENG-M-54-656-624). Dec 1942. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The operating life of each of the switches used was tested. Type B-5A switch failed after 750 cycles of "on and off" [illegible]

to the welding of contact points caused by arcing. Type B-5a switch with condenser connected across its terminal withstood the test but showed presence of arcing Type B-18 switch withstood the test without any mark caused by arcing at contact points, therefore its use was recommended.

PB 13616. U. S. NAVY DEPARTMENT. BUREAU OF AERONAUTICS. Installation specifications: Model AN/ARW-34 airborne equipment. (NAVAER-EI-152) Oct 1945. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
Bureau of Aeronautics requirements and such other information as is necessary for completing a satisfactory installation of the AN/ARW-34 airborne radio equipment in aircraft for which it is specified are given. Drawings of cable assembly, transmitter and amplifier, and a parts list are included.

PB 17641. U. S. WAR DEPARTMENT. CORPS OF ENGINEER. ENGINEER BOARD. Modification of electric lighting equipment. (Rept 608). Dec 1940. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
This report covers the investigation of the desirability of obtaining electric light equipment of smaller size than the present standard equipment in order to secure greater portability, flexibility, and speed in installing and taking down a camp lighting system. Appendices present a synopsis in tabular form of the results of tests, comparative manufacturer's data, list of principal items of equipment to accompany 3 KV-A lighting set, and schematic wiring diagram of camp. Many parts are deleted.

PB 16511. WINSTON, C. B. Radio noise test on Leland type PE-89 rotary inverter. 20 March 1943. (Army Air Forces. Engineering Division ENG-M-54-656-543-1). 1943. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Investigation to determine whether the PE-89 Rotary inverter has the necessary filtering provided for radio noise suppression. The Mallory MF 1-5 radio noise filter is built into the control box. During testing radio noise measurements were made with a Ferris model 32A Radio noise and Field Meter. These indicated satisfactory attenuation of the radio noise as shown in the curve in appendix 1, so the filter was approved.

PB 14116. WOODS, J. P. Low frequency spark-over in air at low pressures. (Harvard Univ Radio Res Lab Tech Memo 411-TM-47) 1944. 22 p. Price: Microfilm-50¢ - Photostat-$1.00
A report of experimental spark-over data for three types of gaps: sphere gap - one inch spheres, needle gap, and Corning glass bushings. Data were taken for various gap lengths and pressures. The temperature in all cases was between 20 and 25 degrees Centigrade. All tests were made at a frequency of 60 cycles. Spark-over voltage is influenced by frequency, but this effect is considered to be negligible at power supply frequencies. Report includes drawings of gaps and graphs of results.

PB 14152. WOODS, JOHN P. Principles for the design of small power transformers. (Harvard Univ Radio Res Lab Rept 411-78) Jan 1944. 21 p. Price: Microfilm-50¢ - Photostat-$1.00
This report lays down general principles for the design of small transformers of the type used in radio equipment and working at frequencies in the range 100 to 3000 cycles. It is shown that for minimum total power loss, the copper loss should be approximately equal to the iron loss. Equations are set up making use of this principle and involving other factors. Relative transformer dimensions for minimum percentage power loss and minimum weight respectively, are determined. A certain lamination shape is selected as being optimum, and, for this lamination shape, there are given graphs relating output volt-amperes to circular mils per ampere, flux density, and lamination width. A graph is given relating output volt-amperes per pound of transformer to design frequency.

PB 16503. WRIGHT, J. L. Charging current versus charging voltage for Type G-1 24 volt aircraft batteries. (Army Air Forces. Eng. Div. ENG-M-54-656-625). 1942. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
Tests to report average characteristics of a group of 10 batteries to obtain optimum charging voltage and current rate to maintain a normal 90% charged battery under average flight conditions. Tests were continued until a float charging rate was reached which indicated that the battery would continue to absorb this rate of current for a period in excess of 5 hours. Curves given are plotted in terms of charging current against time for each specific voltage. Temperature rise is noted on each curve. Will reproduce poorly.

PB 10133. WRIGHT, JAMES L. Electronic turbo-regulator system, Type (Experimental). Aug. 25, 1942. (Army Air Forces. EXP-M-54-656-290-II). Aug 1942. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Report of trip to the Minneapolis Honeywell Regulator Corporation, Aero Denseno, to observe operation of proposed regulator equipment as installed in a B-24D airplane and to assist in completion of specifications to cover manufacture, acceptance and performance tests of an electronic control system to govern automatic regulation of the discharge pressure of a turbo-supercharger installation.

## Miscellaneous

### German

PB 1o458. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Evaluation report on German alkaline storage battery. (Reg 2469) Mar 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The subject equipment is an electrical storage battery of the alkaline type, manufactured by the Deac Company. The battery apparently is part of a signaling set used for communication between dugouts or trenches consisting of periscope and lamps equipped with bright and dark filters. Photograph is included.

### United States

PB 5080. AUSTIN, C. R., and GILLETT, H. W. Examination of enemy material (OD-113) (AC-77) (M-119): Metallurgical examination of German arc-welding electrodes: Progress report, Aug 31, 1945. (OSRD Rept 5926) Sep 1945. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
An examination was made at Batelle Memorial Institute of German arc-welding electrodes: Thermanit X, Thermanit P and Thermanit M. They were reported to have been taken from the high-frequency furnace plant of the Duetsche Edelstahlwerke A. G., which was operated as an adjunct of the large Bochumer Verein plant at Bochum. All of the core wires were alloy steels, the chemical analysis of which is presented in tabular form. The coating of Thermanit X was unique in comparison with U. S. practice as it contained no ferro-alloys. Comparisons cannot be made with U. S. practice on the other electrodes, as their specific uses were not stated. Tables present weights and dimensions of electrodes, composition of coatings, and the approximate batch compositions. The petrographic examination indicated that the principal mineral constituents present in each coating were calcium carbonate and calcium fluoride. Rutile was identified in Thermanit P and dolomite in Thermanit X.

PB 16506. DAVIS, R. H. Kit for vulcanizing splices in insulated cable. (Army Air Forces. Expt. Eng. Sect. EXP-M-54-656-547). Aug 1942. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Tests on vulcanizing kit submitted by Mines Equipment Co., designed to vulcanize splices in various types and sizes of insulated cable. This is similar to earlier kits except that the vulcanizing heater unit is an integral part of the kit, and cast iron and plastic materials have replaced aluminum. After making recommendations on design changes, this kit was considered as satisfactory.

## FOOD AND KINDRED PRODUCTS

German

PB 18902. BACKES, J. VALENTINE. Albumen and egg substitute industries. (BIOS Final Rept 32, Item 22) Aug 1945. 20 p. Price: Microfilm-50¢ - Photostat-$3.00

The investigation into the manufacture of egg substitute and albumen indicates that production was first fostered by the German Government in 1934 in a drive to discourage importation of goods requiring foreign currency. About that time, T. Miltner, a German inventor, took out patents for the manufacture of albumen from fish. The Herman Goering Group fostered development of the idea of offering this product as an alternative to all those industries using hen albumen, and a company known as Deutsche Eiweiss-Gesellschaft was formed in 1934. The product was called Viking Albumen, but was generally known as German Albumen. The most popular egg substitute was known as Milei, manufactured by a company of the same name, from milk and whey. Many other egg substitute companies existed but these were formed into a pool as they represented blenders rather than manufacturers of basic material. One of this group of manufacturers was Plenora-Werke Rugamer & Co., which blended dry blood plasma with starch, dried milk, and locust bean flour. This company also processed blood obtained from slaughter houses, retaining the white plasma which was spray dried for use in the production of egg substitute. As a by-product of the production of high quality cellulose from locally grown beechwood at the Westfalische Zellstaff A.G., Welshausen near Arnsberg, a variety of albumen was produced from the liquors containing wood sugars, etc., by the action of a certain mycelium. The production of synthetic albumen by this process was developed by Dr. Peukert, Braun Institute GmbH, Weimar. By treating the sulphite liquor with a culture of oidium lactis, a white tasteless and odorless paste containing about 30 percent of protein was obtained. This paste was colored and flavored to render it marketable as a sandwich spread.

PB 18897. CAMPBELL, W. G. and BUNKER H. J. The saccharification of wood by the Bergius process at Süddeutschen Holzversucherung Werke A. G., Regensburg. (BIOS Final Rept 7, Item 22) Aug 1945. 11 p. Price: Microfilm-50¢ - Photostat-$1.00

Most of the wood received at this plant for saccharification by the Bergius process is in the form of small logs, about 6 feet in length, and 6 to 8 inches in diameter. The wood is reduced to small chips in a crushing plant, and conveyed by cyclone to a revolving drum drier, heated by waste flue gasses. Wood chips with 5 percent moisture are fed into 4 batteries of acid diffusers. Each battery consists of the 7 diffusers used in the complete operation of extracting the wood carbohydrates. The diffuser is a steel cylinder lined with bitumen, upon which has been superimposed 2 layers of acid-resisting tiles. The first diffuser is filled with a 28 to 30 percent concentration of cold hydrochloric acid. The extract is passed through the remaining six diffusers in series, and at the same time the acid concentration is gradually increased until it reaches a concentration of 55 percent in the seventh diffuser. The extract from the seventh diffuser is returned to the first, and passed through the others in series. When it finally collects again in the seventh diffuser it is drawn off. The complete diffusion process takes 55 hours. The extract now contains 28 percent dissolved carbohydrate. Part is returned to circulation and part is conveyed to vacuum stills from which HCl in 40 percent concentration is recovered at about 40° C. A 60 percent solution of carbohydrates containing about 3 per cent of HCl remains in the still. This solution is diluted with water to a carbohydrate concentration of 20 percent and the sugars are inverted at 130° C. Thereafter the system is neutralized with calcium hydroxide or ammonia and diluted to a sugar concentration (i.e., total reducing substances) of 3 percent. The yield of sugars by this process was stated to be 60 percent of the dry weight of the original wood. Manufacturing processes for producing yeast, yeast extract and yeast spice are described. The albumin containing preparations are made by extracting the cellulose from the wood with muriatic acid. The muriatic acid is then removed from the wood sugar solution in a vacuum [illegible] ing plant, and afterwards the product is neutralized and cleaned by active cold. The sugar in this cleaned wood sugar solution consists of about 70 percent dextrose, the remaining 30 percent consisting of xylose, arabinose, [illegible] and galaktose. This sugar solution serves as the main [illegible] for the breeding of yeast, although the following food [illegible] are also added: Diammonphosphat, ammoniac, kalium[illegible], magnesiumsulfat. Utilization of the ligneous residue [illegible] left in the diffusers is discussed. It can be made into lignin briquettes or used as a manure and soil improvement remedy, or in the manufacturing of medicinal coal.

PB 18905. CAMPBELL, L. E. and BACKES, J. V. Scientific background of the German chocolate industry. (BIOS Final Rept 57, Item 22) Aug 1945. 39 p. Price: Microfilm-50¢ - Photostat-$3.00

The German chocolate manufacturing industry is less advanced scientifically than the corresponding British industry, according to Dr. Heinrich Finche, German scientific authority in this field. Dr. Fincke stated this to be the case in 1936 in his "Handbuch de kakaoerzeugnisse," and there is no evidence that the situation has changed. Before the war there were considerable exports of German chocolate machinery to the United Kingdom and other countries. The German confectionery machinery industry was in fact more advanced than the chocolate industry itself. An ingenious wrapping machine for covering with cellophane the circular 8.5 centimeter chocolate cake for the Wehrmacht was made by the firm of Loesch, Dresden. There is no reason to believe that German chocolate manufacturers have any more knowledge of the principles underlying the formation and prevention of fat-bloom than British manufacturers, although willingness to maintain a multiplicity of machinery in the tempering of chocolate may have led to production of a relatively stable non-blooming article. No steps unknown to allied manufacturers were found to be taken in Germany to make chocolate capable of withstanding tropical temperatures. Brief information on the factories visited, their location and product is given. A translation of Dr. Fincke's paper "Ueber das gefuge der schokolade" ("On the structure of chocolate") appears in the appendix. A list of references is also included.

PB 18944. HINTON, C. L. Preliminary report on jam manufacture in Germany. (BIOS Final Rept 193, Item 22) Oct 1945. 13 p. Price: Microfilm-50¢ - Photostat-$1.00

Four factories were visitied, the most important of them being the Schwartauer-Werke, near Lübeck, with an output in normal times of 20,000 tons per annum. The large Helvetia factory of Gross Gerau, near Frankfurt/Main, mainly engaged in producing canned and dried fruits and vegetables, has a jam department which formerly produced about 8,000 tons of jam per annum. Smaller firms visited were the Loewenwerke, of Heilbronn, with a normal production of several thousand tons per annum, and the Grönland factory, of Grevenbroich, near Cologne, with quite a small output. In addition, two research institutes were visited: Institut für Genuss- und Frucht-verwertung, Geisenheim; and Institut für Lebensmittelforschung und Lebensmittel-technik, Munich. Pre-war standards in Germany provided for two grades of jam: Preserves and single-fruit jams, with at least 45 parts of fruit to 55 parts of sugar; and mixed fruit jams, of a pasty consistency, with at least 25 parts of fruit to 55 parts of sugar. In the former grade, the water content was limited to a maximum of 35 percent, in the latter to 42 percent. This would mean a minimum soluble solids content of about 63 to 64 percent in the one grade, or about 57, to 58 percent in the other. Addition of pectin was permitted. No preservatives were allowed in the jam, but to overcome possible trouble due to mould, it was permissible to brush over the covering papers with solution of benzoic or formic acid or certain benzoic acid derivatives. The only jams now produced are of the mixed fruit type, in particular the so-called "four-fruit jam", with the soluble solids down towards the figure of 60 percent. The pre-war standards required that not more than 50 percent of the total fruit should consist of apple or pear; but this has now been waived, and in one recipe being used, nearly two-thirds of

the fruit was apple. Moreover a further debasing of jam production has been countenanced by allowing the use of such ingredients as pumpkin, rhubarb, and tomato in place of fruit; and formic acid was being used in the jam itself and not merely for brushing on the covering paper. On the other hand, in view of the shortage of sugar, less sugar and a considerably larger proportion of fruit pulp than was formerly usual were being used in these jams. Only raw sugar is at present being supplied to jam factories, and this has a markedly adverse effect on the set and appearance of the jam. The lower grade jams are boiled in deep open pans or in vacuum evaporators. No indications of special developments of technique were seen except, in one factory, a continuous plant for the pulping of hard fruits. This consists of a vertical copper cylinder about 2 feet in diameter and about 20 feet high, with a funnel shaped bottom and a central steam tube, all of copper. The fruit, after a preliminary washing, is hoisted to the top of the cylinder and dropped in, being sprayed with steam jets from the central tube and the funnel-shaped bottom. The cooked fruit issues through an opening at the bottom into a crushing machine (for apples) or a sieving machine (for stone fruits). Information on firm, personnel and activities of the places visited are included.

PB 18811. VIS, C. and others. Oils and fats industry. (BIOS Final Rept 86, Items 22, 31) Aug-Sep 1945. 57 p. Price: Microfilm-$1.00 - Photostat-$4.00

In Germany the general tendency in oil-milling is double or sometimes treble expelling followed by solvent extraction whereby the oil content of the seed is reduced to 1 percent or lower. No new designs of expellers were seen, but Fritz Müller, Esslingen-Neckar, is developing a large machine having an output of 150 tons every twenty-four hours as compared with the 48-72 tons in the same time given by the largest expellers they manufacture at present. Extraction by both batch and continuous processes were in operation, the tendency being for the latter process to displace the former. In the refining of oils the neutralizing, bleaching and deodorizing operations were carried out on conventional lines. In the hydrogenation of oils and fatty acids, nickel formate was the catalyst in general use, the main reason given for its selection being the ease with which it can be reduced. Batch autoclaving at pressures ranging from 12-40 atmospheres has largely replaced Twitchelling for fat splitting but there was no evidence that any attempt had been made to carry out the process in a continuous manner: A catalyst such as zinc oxide is employed only at the lowest pressure. All edible oils are treated for lecithin recovery, one of the main uses for lechithin at present being as an emulsifier in margarine. Carotene is obtained from palm oil by extracting a solution of palm oil soap with benzine. In the extraction of carotene from carrots, the carrots are digested with a small amount of caustic soda and then with an edible oil. Moisture is removed in a vacuum drier and finally the oil is expelled from the dried material, any residual oil remaining after the expelling treatment is extracted with benzine. No new plant or machinery was observed in the margarine factories that were visited. During the war synthetic glycerides prepared from synthetic fatty acids were used to the extent of 100 percent of the fat in margarine, and 80 percent of the margarine so produced was supplied to the German army and navy. The production of synthetic acids by air oxidation of gatsch from the Fischer Tropsch process appears to have increased very considerably during the war: A flow sheet of the process at the Markische Seifen Industrie is included. The O.X.O. process for the manufacture, from Fischer Tropsch olefins, of fatty alcohols which are ultimately sulphated to give detergents, is an extremely interesting development especially in view of the fact that the cost of the alcohols is not a great deal more than the cost of the synthetic acids. Although up to the time of this report, alcohols had only been made on a 1,000 tons a year scale in a pilot plant, a commercial plant capable of producing 10,000 tons a year is practically ready for operation at Ruhr Chemie. A brief history of the plants visited and description of their products and processes are given. Composition of pre-war and war-time products, including unit ration soap, are given.

United States

PB 18896. CAMPBELL, W. G. and BUNKER, H. J. Report on visit to the Zellstoffe Fabrik A.G. near Regensburg: Production of yeast. (BIOS Final Rept 5, Item 22) Sep 1945. 3 p. Price: Microfilm-50¢ - Photostat-$1.00

The works are engaged primarily in the preparation of wood pulp by the ordinary sulphite process. No pre-hydrolysis of the wood is carried out. The waste liquor obtained is fermented by Torula utilis for food yeast. It is aerated hot and brought to pH 5.0 with lime. Potassium chloride, magnesium sulphate and either diammonium phosphate or calcium superphosphate are added. Liquid ammonia solution is used as a source of nitrogen in the fermentation. The chief feature in which this plant differs from other Waldhof factories is that the yeast cream is spray-dried to give a powder, instead of being roller-dried to give flakes. The yeast plant, when it was working normally, had produced an average of 7 tons a day. The material was used for human as well as animal consumption. This report will not reproduce clearly.

PB 18589. U. S. WAR DEPARTMENT. QUARTERMASTER CORPS. Cutting and preparing lamb. (Tech. Manual TM 10-408) Jul 1943. 28 p. Available from Supt. Documents. Price 10¢

This manual is designed to present graphically the technique of cutting lamb, and to offer some suggestions concerning its preparation and service. It supplements paragraphs 33 and 56 of TM-405 which supplies information concerning the cutting and preparation of lamb. Photographs.

PB 18412. U. S. WAR DEPARTMENT. QUARTERMASTER BOARD. Final report of test of dehydrated preserved butter. (Project T-168) Aug 1943. 5 p. Price: Microfilm-50¢ - Photostat-$1.00

The majority of the users consider the dehydrated preserved butter satisfactory for table use, although preserved butter, commercial, and army spread are preferred. Dehydrated preserved butter is suitable as a shortening agent in baking. Findings are given on use of dehydrated butter on convoys, suitability of dehydrated preserved butter in baking, and keeping qualities of dehydrated preserved butter. See also PB 18415 and PB 18416.

PB 18417. U. S. WAR DEPARTMENT. QUARTERMASTER BOARD. Observation report of Army bread toaster. (Project S-89) Nov 1943. 8 p. Price: Microfilm-50¢ - Photostat-$1.00

Based on observations made it is concluded that the subject toasting unit will produce its rated capacity of 2,200 slices of toast per hour of commercially made bread. Due to the fact that the conveyor baskets cannot be adjusted to hold four slices of army one and two pound loaves, the rated capacity would probably be less when army bread is used. Conduct of test and observations are reported.

PB 18415. U. S. WAR DEPARTMENT. QUARTERMASTER BOARD. Preliminary report of test of dehydrated preserved butter - QMB-318. (Project T-168) May 1943. 8 p. Price: Microfilm-50¢ - Photostat-$1.00

The majority of the users considered the dehydrated butter satisfactory for table use. The dehydrated butter powder is not an adequate substitute for cream or milk in flavoring coffee, but is preferred to no flavoring at all. Conduct of test and findings are presented. See also PB 18412 and 18416.

PB 18416. U. S. WAR DEPARTMENT. QUARTERMASTER BOARD. Second report of test of dehydrated preserved butter. (Project T-168) Jun 1943. 6 p. Price: Microfilm-50¢ - Photostat-$1.00

The majority of the users consider the dehydrated preserved butter satisfactory for table use, although the preserved butter, commercial, and the army spread are preferred. Dehydrated butter is suitable for baking purposes because of ease in preparation and acceptability of the finished product See PB 18415 and PB 18412.

## FUELS AND LUBRICANTS

German

PB 17390. ARBEITSMAPPE DACHS I (Plans of plant Dachs I) (MIS VII 67g 7000309) Oct 1944. 64 p. Price: Microfilm-$1.00 - Photostat-$6.00
Collection of plans of a subterranean refinery plant at Porta. Lists of machinery, equipment and installations.

PB 13434. COCHRAN, J. B. Laboratory analyses of captured German oils - polyethylene lubricating oils. (Naval Res Lab) Dec 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The report covers an analysis of 3 captured German oils. They have been analyzed to determine some of the physical and chemical properties. Some comparisons have been made with American petroleum oils as to flash point, viscosity, pour point, etc.

PB 12613. COTTON, ERNEST. The German Fischer-Tropsch Process. 1946? 16 p. Price: Microfilm-50¢ - Photostat-$2.00
This typewritten report covers the Fischer-Tropsch method for production of synthetic fuels. The synthesis requires 2 volumes of hydrogen to one volume of carbon monoxide. The Germans used the water gas method to produce these gases using a catalyst to convert the gases to the proper 2:1 ratio. They also used the methane oxygen method which gave the required 2:1 ratio more directly. German commercial synthesis used a cobalt catalyst which produced gasoline with a low octane rating. However, there was another process using an iron catalyst which produced gasoline with a higher octane rating. The end product contained $C_3$ and $C_4$ hydrocarbons. The remaining liquid consisted of gasoline, diesel oil, heavy oil and wax. Percentages depended upon synthesis methods used. Attached are flow diagrams showing 1. the methane-oxygen process, 2. catalyst production and 3. cobalt catalyst reduction; also attached are diagrams showing sections of the normal and medium pressure reactors. The writer of this paper is a member of the U. S. Government Technical Oil Mission.

PB 7794. DEES, H.C. and BARNARD, D.P. Aviation fuels and lubricants - Technical Intelligence exploitation - I. G. Farben, Leuna, and Junkers Motoren, Dessau. (AAF Tech Intelligence Rept I-7) May 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
German engineers and scientists were interrogated on test and development activities of the two companies. No information of practical value is included, the report being a review of general policies and projects in force at the time of surrender.

PB 14621. EGGS, S. Kältebeständigkeit von betriebsstoffen (Cold stability of fuels). (ALSOS Mission, Klotter File 11D) Dec 1937. 11 p. Microfilm-50¢ - Photostat-$1.00
In this report the importance of a low solidifying point for aircraft fuels is stressed, the dependence of flow resistance on temperature and composition is established, and laboratory testing methods on various fuels to determine the crystallization point and degree of filtrability at various temperatures is described. Similar tests were made on lubricants. Graphs, photos, drawings, and a bibliography are included in German.

PB 17318. GREAT BRITAIN. MINISTRY OF SUPPLY. CHEMICAL RESEARCH AND DEVELOPMENT DEPARTMENT. Summary of report on the development of a method for the preparation of polyxol greases. (C.P.V.A. Report 9). 1946. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an abstract of a report on the development of a method for the preparation of polyxol greases by the Coal and Oil Research Institute Technical School, Berlin. The chief interest lay in producing greases with good low temperature properties for aircraft instruments. It was found that the limit of low temperature workability of the grease was approximately the same as the setting point of the original oil, and experiments were made with low viscosity, low setting point spindle oils instead of motor oils.

PB 17371. I.G. FARBENINDUSTRIE, LUDWIGSHAFEN. Hochdruckversuche (Technical data of synthetic oil plant) (MIS VII 71c 7002992) 1944. 44 p. Price: Microfilm-50¢ - Photostat-$3.00
This file contains office memoranda, correspondence, and technical data on high-pressure experiments in a synthetic oil plant of the I. G. Farbenindustrie.

PB 18436. METZEN, VON. Erste bericht über das gärtorfverfahren. (First report on peat research) (German Mission, RPE 708) Jun 1944. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
Linker's aim was to produce a dense coal like substance of properties comparable to coke. Peat was heated, ground, pressed to extract moisture and molded. Tables show progress made from 1937 to 1939. Additional work had been done to further dehydrate the peat by natural and artificial means.

PB 18786. REED, FRANK H. Study of metallurgical coke developments in methods of production and testing. Roechling sche Stahlwerke, Völkingen, Saar. (FIAT Final Rept 531) Nov 1945. 136 p. Price: Microfilm-$1.50 - Photostat-$10.00
A copy of Dr. Ing. Henry Hoffman's original article in German on the testing and evaluation of blast furnace coke "Beurteilung, prüfung and bewertung der physikalischen beschaffenheit von hochofenkoks," makes up the body of the report. It is preceded by a summary in English. The quantitive evaluation of the physical properties of metallurgical coke for blast furnace use is discussed in detail by Dr. Hoffman. Coke structure, bulk density and the various stability tests are reviewed. Although the experienced blast furnace operator becomes sufficiently expert in evaluating coke quality to make changes in operating conditions necessarily for a certain degree of efficiency, his judgment is necessarily empirical and is based upon several properties of the coke. Proper sampling for test purposes is difficult and many of the tests have not been adequately developed. Stability tests made on coke produced from a stamped charge of Saar coal show that the top, middle and bottom parts of the oven charge have different stabilities. The coke from the middle part gave a higher percentage over 40 mm size. The coke from the top of the charge is more friable, while that from the bottom is more fissured, has smaller piece size, but is more stable. The physical constitution of coke from different horizons of the coke charge is subject to large fluctuations. Size and structure of the coke cells have considerable influence on reactivity. Roughly, the average bed temperature seems to be lower with lower grain stability, low specific gravity and low porosity, although there are many exceptions to this generalization. Bulk density determinations are greatly influenced by piece size and classification, moisture content, size of measuring vessel, leveling of the charge and procedure of making the test. The more important methods and variables are discussed. The formulas of Rombach, Curran, Marquard, Thiel and Völkingen for evaluation of the physical characteristics of blast furnace cokes are given and discussed. Photographs, tables and graphs are included.

PB 17375. RUHRCHEMIE A.G., OBERHAUSEN - HOLTEN Project 8: Technical drawings (MIS VII 67 g 7000308) Jan 1945. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
Correspondence and plans for the installation of the Project of the synthetic fuel manufacturing company Ruhrchemie A.G. in subterranean premises disignated as Dachs V

PB 18793. U. S. FOREIGN ECONOMIC ADMINISTRATION. ENEMY BRANCH. Study of the Interagency Drafting Committee on the treatment of the German petroleum industry from the standpoint of international security. (Tech. Industrial Disarmament Committee Project 6) Oct 1945. 58 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report presents an historical, statistical and analytical study of the past and future of the German oil industry. It is recommended that all Bergius hydrogenation and Fischer-Tropsch synthesis complexes be eliminated and that the erection of new plants in Germany to produce oil synthetically from coal or other carboniferous materials be forbidden. It is also recommended that the import of crude and semifinished products should be controlled and limited in quantity and quality and that domestic crude oil production and refining should be controlled in order to control any crude oil discoveries. No attempt to control the production of shale oil, alcohol, or solid fuel substitutes is suggested unless they are developed for military uses. Tables and graphs present data.

PB 18783. WILKINS, E. T. The preparation of ultra-clean coal at the Konigin Elizabeth Colliery, Essen-Frillendorf. (Mannesmannrohren Werke A. G. ) (CIOS File XXXIII-6, Item 30) Jun 1945. 5 p. Price: Microfilm-50¢ - Photograph-$1.00
Two 2-stage processes have been developed for producing clean coal of the minimum ash content at the Koningin Elizabeth Colliery, Essen-Frillendorf. Process 1 treats coal sized about 10-1 m.m. The treatment consists of a preliminary cleaning in a specially designed heavy medium washer, followed by crushing and recleaning by froth flotation. Process 2 was intended to treat coal sized 1.0-0.1 m.m. The treatment was a preliminary cleaning by means of a newly developed electrostatic dry cleaner, followed by crushing and re-cleaning by froth flotation. The Vogel washer, Gruesenburg froth-flotation machine and the "Ter Meer" centrifuges (made by Becher Wyss Maschinenfabrik of Ravensburg) are described. Costs and outputs are given. A production table based on the performance of the plant during February 1944 is included.

Japanese

PB 18732. SUPREME COMMANDER FOR THE ALLIED POWERS, NATURAL RESOURCES SECTION. The coal industry of Japan in recent years. A preliminary statistical report, Dec 22, 1945. (U. S. Army Tech. Intelligence Center, Tokyo, Rept 21) Dec 1945. 47 p. Price: Microfilm-50¢ - Photostat-$4.00
Japan's peak production of 57 million metric tons of coal was attained in 1940. Japan's consumption also reached an all time high in 1940, being 66 million metric tons at 5½ million tons per month. Stockpiles increased tremendously, from 1,700,000 metric tons at the end of the fiscal year of 1940 to 4 million metric tons in 1945. By Nov 30, 1945, a total of 2,700,000 metric tons was still listed in stockpiles, although half of this was reported practically inaccessible because of transportation and loading difficulties. The physical capacity of Japanese coal mines is now sufficient to produce at least two million tons per month provided additional wire rope, nails, timber and other critical supplies are received. The chief deterrents to production have been the lack of workers in the mines because of inadequate food and wage incentives and the lack of profit incentive to the owners. Tables, charts, graphs and maps present statistical data. A list of national resources reports is appended. Data in report were drawn primarily from information submitted by Japanese agencies.

United States

PB 5920. BECKMAN, ARNOLD O. and others. The stainless steel propane injector. (OSRD Rept 5042) Feb 1945. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
A compact, light weight, stainless steel injector unit has been developed which operates on liquefied petroleum gas. The use of liquefied petroleum gas eliminates the necessity for an air compressor while the use of stainless steel greatly reduces the corrosion which otherwise results when acetic acid is used in the bubblers. Experimental and performance tests are described in detail. A cross-section of the aspirator is shown in Figure I, and the complete unit in Figure II. The fuel consumption is shown graphically in Figure III. The suction produced with various jet pressures was measured at zero air-flow; the data obtained are shown in figure IV. The flow through a Porton bubbler filled with glass beads and containing 20 cc. of acetic acid is shown as a function of jet pressure in Figure V. With a simulated impactor in the suction line, flow-rates were measured as a function of jet pressure. The results are shown in Figure VI. The efficiency of the aspirator expressed in gas-flow is plotted as a function of jet pressure in Figure VII.

PB 5303. FEDERAL POWER COMMISSION. Principal natural gas pipe lines in the United States and communities served with natural, manufactured, and mixed gas. 1943. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The map is based on maps and reports filed with the Federal Power Commission. Will not reproduce well.

PB 18119. GORDON, ROBERT. Viscosity of diluted lubricating oils. (AAF, ATSC Memo Rept EXP-M-57-532-89) Nov 1942. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
Fuel and Lubricants Unit of the Power Plant Laboratory requested that a scale be determined that would allow the relation between viscosity and per cent dilution to be given as straight lines. A non-linear scale for per cent dilution has been developed and the viscosity data replotted as straight lines. Method used to determine the scale is detailed in Appendix and illustrated with curves C to Z.

PB 18616. HARDY, W. L. and HIRSCH, J. M. A comparison of the starting characteristics of 1100 grade aviation oils. (AAF ATSC Tech Rept 5320) Nov 1945. 446 p. Price: Microfilm-$4.50 - Photostat-$30.00
Study of the characteristics of 1100 grade aviation oils which are related to starting at low ambient temperatures between + 10° and -65° F. Esso Laboratories of the Standard Oil Development Co., Research Division made the study at the request of the Army Air Forces. Evaluation of flowability and viscosity under cranking conditions of 342 blends with varying amounts of aviation gasoline dilutions and pour depressants and dewaxing is shown in tables, curves, and charts, which make up the largest portion of the report. Testing equipment is shown in photographs and drawings.

PB 18117. HIRSCH, J. M. The effect of one per cent lubricating oil upon the lubrication properties of aircraft engine fuels. (AAF ATSC Engineering Div Memo Rept TSEPL-5-531-447) Aug 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Wear-load curves on the Four-Ball Extreme Pressure Lubricant Tester were obtained on several blends of 1% lubricating oil in several aircraft engine fuels. No apparent differences in lubrication were observed in most cases though a moderate improvement was effected with 1% of Specification AN-VV-O-446a to Specification AN-F-28, Amendment 2 aircraft engine fuel. Viscosities at 100 F. and -40 F. are given for the various blends and wear-load curves are included.

PB 9799. HORNKOHL, F. F. Low temperature grease project: Progress rept 1. (AAF Exp Eng Sect EXP-M-56-4043) Oct 1942. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
This report contains a discussion of grease requirements and the results of testing experimental and production batches of grease submitted by various manufacturers for compliance with AN-G-3. Specifications, grease, low temperature.

PB 16293. KNAPP, C. H. Evaporation of hydraulic fluid. (AAF Eng Div Memo Rept EXG-56-M-4644) Oct 1943. 9 p. Price: Microfilm-50¢ - Photostat-$1.00

Investigation of the effects of evaporation on the physical properties of Specification AN-VV-O-366b hydraulic fluid. It was found that the increase of viscosity due to evaporation of non-volatile components of the fluid depends on the temperature at which the fluid is evaporated. Appendices contain test procedures and data on the rate of evaporation at different temperatures, and on the change in physical properties of the hydraulic fluids, given in tabular form. Viscosity temperature curves of the original fluid, and fluids evaporated 16% at both 158 F. and 210 F. are shown.

PB 18984. PEASE, G. R. Effect of small amounts of suspended water on the initial quenching speed of fast quenching oils. (Springfield Armory Eng Dept Lab Tech Rept 46-387) Jul 1945. 3 p. Price: Microfilm-50¢ Photostat-$1.00
When an oil-in-water type emulsion is used for quenching steel, the cooling rate through the transformation zone is slower than the cooling rate of either the oil or water alone. It was found that as little as a few tenths of a percent of water finely dispersed in a normally "fast" oil so reduced the initial quenching speed of the oil that it no longer quenched satisfactorily. Further tests have demonstrated that this effect of a small amount of suspended water is characteristic of at least three commercially available oils, all of which normally show high initial quenching speeds. This relationship is shown in appended graph 1 where the percent of suspended water, determined by distillation, is plotted against the initial quenching speed as measured by the 5 second quench test. Data for the curves in graph 1 were obtained by making quenching speed tests and water content tests on samples of oil into which water was artificially introduced as steam. Text of report may not reproduce clearly.

PB 6584. WHEELER, JOHN W. Submarine pipe line (and supp. motion picture). (U.S. War Dept Eng Bd Project OSB 436.) Dec 1943. 80 p. Price: For report only - Microfilm-$1.00 - Photostat-$6.00. (The motion picture reel will be available for inspection through the Library of Congress).
Studies to determine the feasibility of the construction of an undersea pipeline for the transportation of large volumes of liquid fuel are described in this report. Various phases of the work include investigation of methods for pipe assembly, pipe launching, pipe towing, and methods of connecting lengths of pipe together. This report recommends that the project be abandoned and no further investigations be made. The investigations were conducted at Martha's Vineyard Experimental Base during the period from August to December 1943. The report also covers studies and tests made by the Signal Corps Detachment on methods whereby the towing vessels and, therefore, the pipe line can be held to a predetermined course and the individual sections stopped at predetermined points, thus spotting the successive lengths in position for connecting. It is believed that a pipe line, approximately 30 miles long, and with depths not over 150 feet, could be constructed. However the desired lines in the neighborhood of 70 to 105 miles, approximately 2/3 of this length being at depths in excess of 150 feet, are not considered feasible. Appendices contain a discussion of the investigation, drawings and photographs, and comments on Signal Corps activities in connection with the project. A 16-mm silent motion picture reel in color (running time, 18 minutes) supplements this report. This reel will be available for inspection through the Library of Congress.

## HIGHWAYS AND BRIDGES

PB 5098. HOFFMAN, HARRY D. Raising and repairing of structural steel bridge over the Weichsel river at Thorn, Poland; with enclosure: Bauckenbau in Thorn in Kaiegs winter 1939-1940, by Dortmunder Union Bauckenbau A. G. (Bridge building in the war winter 1939/1940). (Naval Tech Mission in Europe Letter Report 132-45 (y) Jun 1945. 34 p. Price: Microfilm-50¢ - Photostat-$3.00
This heavy railroad bridge, demolished by the Polish army when they retreated in the fall of 1939, was originally built by the Germans in 1870-1873. The job of rebuilding two abutments, lifting and repairing four bridge ends was completed in six months. Enclosure "A" consisting of 58 photographs is a pictorial presentation of the methods employed. Essentially, the job involved building large structural steel portals on both ends and over the fallen section, and lifting it slowly by means of hydraulic jacks installed in the portals.

PB 18530. U. S. WAR DEPARTMENT. Fixed steel panel bridge, Bailey type. (Tech. Manual 5-277) Sep 1941. 79 p. Available from: Supt. of Docs., GPO, price 20¢
The fixed steel panel bridge, Bailey type, is designed to carry all military loads. This manual contains a description of the equipment and instructions for its use, construction, and maintenance. Diagrams, photographs, tables, and graphs are included.

PB 18561. U. S. WAR DEPARTMENT. V-type steel trestle equipment. (Tech Manual 5-375) Feb 1944. 106 p. Price: Microfilm-$1.50 - Photostat-$8.00
This manual is concerned with the steel units constituting V-type trestle equipment which can be used for erecting marine piers, highway bridges, highway bridge piers, and light railway bridges. Equipment is described and both standard and non-standard construction are covered. Use of construction tables and log sheets is outlined. Photographs and diagrams complement the text.

PB 18567. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. Floating bridge, M4 (Tech Bul ENG 61) Feb 1945. 142 p. Price: Microfilm-$1.50 - Photostat-$10.00
This technical bulletin describes the floating bridge M4, its construction and its use. Tables present data on basic bridge set and transportation and erection equipment set. Photographs and diagrams are included.

PB 15521. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Evaluation report of German model "B" bridging equipment. (Rep 2854 and Rep 2855) Jun 1945. 19 p. Microfilm-50¢ - Photostat-$2.00
The German "B" ponton and trestle bridge described herein was the standard bridge used by the German engineers in infantry and motorized divisions. It can be constructed to carry 4,9, or 20 (24) tons. There are three types of trailer loadings used in carrying this equipment (trestle, ponton, and ramp). A list of the components, giving dimensions, weights and uses is given. Schematic diagrams for the loadings on the ponton and trestle trailers are attached. Photographs are included.

PB 18560. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. Requisitions for stock-pile railway bridges and trestles. (Tech Bul ENG-56) Jan 1945. 54 p. Price: Microfilm-$1.00 - Photostat-$4.00
This bulletin describes methods of ordering materials for erection of standard steel railway bridges and trestles. It deals principally with requisitions submitted by units in the field for construction at particular locations, and supplements TB ENG 12, Stock-pile Railway and Highway Bridges, Mar 15, 1944. Photographs of equipment and tables giving descriptions of sets of railway bridge equipment, and bridge conversion sets are given.

PB 18546. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. Floating panel bridge, Bailey type, M1, on 25-ton pontons. (Tech. But 5-277-8) Jul 1945. 112 p. Price: Microfilm-$1.50 - Photostat-$8.00
This technical bulletin describes the make-up, transportation, construction, and maintenance of the floating bridge, Bailey type, M1, on 25-ton pontons. The British Bailey pontoon bridge is described briefly in an appendix. Photographs, diagrams, tables.

## INSTRUMENTS (PROFESSIONAL, SCIENTIFIC AND CONTROLLING)

### German

PB 4803. BOPP & REUTHER G.m.b.H., MANNHEIM, GERMANY. The new "Large Optima 101" patent inferential water meter of 2" - 6" diameters (English and French). n.d. 25 p. Price: Microfilm-50¢ - Photostat-$2.00
This sales bulletin describes the Large Optima water meter which is manufactured for fitting into district conduits for factories, hotels, hospitals, etc., having strong fluctuations in the consumption of water. The meter is preferably supplied as a dry dial meter, because within main pipe-lines, there is generally a greater danger of the dial gears becoming soiled. By special desire however, it can also be supplied as a wet dial meter. The bulletins contains 9 figures showing construction and function of the meter, clock work and dial of the dry dial meter, arrangement of the wet dial meter, service diagrams, and chief overall dimensions.

PB 4798. BOPP & REUTHER G.M.B.H., MANNHEIM, GERMANY. Venturi-Mengenmesser (Venturi-volume meters). n.d. 64 p. Price: Microfilm-$1.00 - Photostat-$5.00
This German catalog describes in brief the Venturi-principle. It contains 61 illustrations showing the various types of Venturi-meters manufactured, their connections and installations. There are also 29 installation drawings giving outside dimensions of various meters for installation purposes.

PB 18745. GERMANY. REICHSFORSCHUNGSRAT. Ein vergleich eines thermoelektrischen mit einem lichtelektrischen photometer bezüglich empfindlichkeit gegenüber temperaturschwankungen. (Comparison of heat sensitivity of a thermoelectric and a photoelectric photometer). (ALSOS Mission, Gerlach 9). (Correspondence on an unpublished article from Sep 1941 through Sep 1942). 50 p. Price: Microfilm-50¢ - Photostat-$4.00
The correspondence contained in this folder refers to an article by A. Schörefeld on the subject matter. It was initiated by the ditor of the periodical spectrochemica acta who found fault with several point in the article and tried to clear them up by correspondence with other sicentists. proof of the article is enclosed. In German.

PB 18294. I. G. FARBENINDUSTRIE. Prüfvorrichtung für kautschukelastische werkstoffe. (Test apparatus for rubber or elastic materials). Dec 1941. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an application of the manufacturer for a registered design on subject equipment. The apparatus uses as testpieces cylindrical rods which can be tested for torsional and bending resistance and fatigue. It is possible to make notches in the testpieces before or during the test and stop the movement of the system upon breakage of the testpiece. The appendix contains a graph showing the principle of the evaluation of tests and a sketch of the apparatus. In German.

### United States

PB 18983. ABBE, E. H. Component separation by magnetic testing devices. (Springfield Armory Eng Dept Lab Tech Rept 46-1313) Oct 1945. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
The need for a rapid non-destructive method of inspecting components, finished or at any stage in their manufacture, to determine whether the proper material had been used and if it had,received the necessary heat treatment and responded correctly to it, has long been felt. A magnetic comparator for this purpose was built for the Springfield Armory by the General Electric Company. It compares an unknown sample placed in one of a pair of coils with a standard piece placed in the other coil. The reading is made on a fluorescent screen. When the two pieces are exactly the same, there is just a straight line across the field. With slight differences the line becomes an elipse and the amount the elipse is open is an indication of the difference. Variations in the chemical analysis as well as in the hardness and in the microstructure will affect the amount the elipse is opened or closed. The degree of separation that can be made is dependent upon homogeneity of the material, the amount of opening of the elipse caused by different combinations of chemical elements, microstructure or hardness and the mechanical tolerance of the pieces. Photographs and circuit diagrams are included.

PB 14858. BOONTON RADIO CORPORATION, Boonton, New Jersey. Instructions for installation and operation of frequency modulated generators. (Navy Dept. NavAer 08-5Q-288). n.d. 18 p. Price: Microfilm-50¢ - Photostat-$2.00
Includes general description, installation, operation, including operating, notes, servicing, specifications and parts list photographs, and schematic circuit diagrams, for frequency modulated generators, Types 150A and 150-AS, 151-A and 151-AS, 152-A and 152-AS, 154-A and 154-AS, 155A and 155-AS.

PB 14909. CAUFIELD, W. B. Operating instructions for D1202-A spectrum analyzer. (Harvard University. Radio Research Laboratory Rept 25). 1943. 14 p. Price: Microfilm - 50¢ - Photostat - $1.00
This document describes the purpose of the D1202-A spectrum analyzer as an instrument designed to measure the energy distribution in any continuous or discontinuous spectrum that falls within a 20-Mc band in the frequency range of 100 to 1000 Mc. its principle of operation, its circuit and mechanical construction, controls and specifications. Respective graphs, diagrams and photographs are appended.

PB 15023. GAFFNEY, F. J. Tentative instruction manual, MIT Radiation Lab. test set (Type A). (Mass Inst of Tech Radiation Lab Rept M-120) 1943. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
The Type A test set is used for checking radar systems in the field and for bench testing of circuits. It provides means for monitoring transmitter power output, receiver sensitivity, the bandpass of the receiver, and the general functioning of the indicator circuit. It is used with a pickup dipole mounted in the radar installation which serves the function of providing a pickup for an echo box which may be used for rough overall system checks. The set weighs about 20 pounds. A description of the RF circuit, pulsed generator circuit, thermistor power measuring circuit, power supply, and accessories of the setup is given, and the operations involved for a transmitter and receiver check are explained. Two drawings illustrate the schematic and physical setup of the test set.

PB 18481. GORANSON, R. W. and others. The measurement of large gransient stresses. (NDRC Rept A-45. OSRD Rept 498). Apr 19, 1942. 36 p. Price: Microfilm-50¢ - Photostat-$3.00
This progress report is concerned with the equipment and methods used for the measurement of stresses generated by propellants and high explosives. The design and response characteristics of gauges are discussed at length. Auxiliary equipment and calibrating methods developed at the Geophysical Laboratory of the Carnegie Institution of Washington for measurements with propellants are described. The methods are generally applicable to problems involving pressures between 50 and 5000 atoms which are applied over periods from $10^{-3}$ to $10^{-6}$ sec. Illustrated by schematic and circuit diagrams, pressure-time curves and drawings.

PB 16778. HANDMACHER, V. J. Graphical integration of colorimetric data. (AAF. Eng Div ENG-M-56-4350). Jan 1943. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
A method of facilitating the computation of the trichromatic coefficients from spectral transmittance and reflectance data is described in this report. It embodies the use of transparent fluorescent plastic superimposed on spectrophotometric curves. A special sheet of dichroic plastic of .025 inch thickness proved satisfactory. Accurately ruled lines were

scribed on it to indicate the thirty selected ordinates for each coefficient and illuminant. Photographs and a typical table of calculations obtained by the use of this method are appended. It would be useful in the investigation of luminescent materials, camouflage finishes and transparent plastics.

PB 15153. KAUKER, J. and others. Spectrum analyser RP-392. (OSRD Report 931-15). 1945. 34 p. Price: Microfilm-50¢ - Photostat-$3.00
This report describes a spectrum analyzer of a double superheterodyne type covering the frequency range from 10 to 3500 mc. Signals are fed directly into a crystal mixer and a single dial tunes the entire range. A constant 30 mc portion of the band is presented on a five inch C.R.T. by a 115 mc logarithmic amplifier. Photographs, diagrams, and graphs are included.

PB 13907. PIERCE, ROGER, J. Preliminary instructions B501 pulse signal generation. (Harvard University. Radio Research Laboratory Rept 22) 1943. 15 p. Price: Microfilm - 50¢ - Photostat - $1.00
This report describes the B501 pulse signal generator as a variable frequency r.f. oscillator modulated by pulses of variable repetition rate and variable length. The frequency range of the oscillator is 100 to 350 Mc and the r.f. output is varied by means of an attenuator through about a 96 db range. It gives instructions for its operation, its circuit diagram and photographs.

PB 13952. RHIGER, R. R. General radio P525-A "Signal generator", (Harvard University. Radio Research Lab. Test Report 411-TR-23) 1944. 14 p. Price: Microfilm - 50¢ - Photostat - $1.00
The GR P525-A is a portable signal generator that provides signals in the frequency range from 90 to 250 megacycles with various types of modulation. The P525-A is intended for instructing operators of radar systems in anti-jamming, and also be used for jamming and anti-jamming studies, and field testing of equipment. Photographs and curves illustrating test results are given in the appendix.

PB 15117. SIMPSON ELECTRIC COMPANY, Chicago, Illinois. Handbook of maintenance instructions for Model 260 Volt-Ohm milliammeter. (Navy Dept. NavAer 08-505-16). 1944. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Model 260 test unit offers a small compact and complete instrument with high sensitivity for testing and locating trouble in all types of circuits. The electrical circuit is designed to give maximum insurance against inaccuracy and damage to the component parts. A physical and a schematic wiring diagram are included together with instructions for use of the set.

PB 15142. TAFT, E. and others. A wide-band spectrum analyzer. (MIRC Division 15. Report, 931-19). 1945. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
Report describes a spectrum analyzer of a double heterodyne type covering the frequency range from 10-1200 mc. A 50 micro-volt signed in a 50 ohm line gives a signal-to-noise ratio of 2 on a CRT. All spurious responses are surpressed at least 35 in the power acceptance range of the instrument. Signals feed directly into a crystal mixer and a single dial tunes over the entire range. A constant 30 mc. portion of the band is presented on a 5 in. CRT by a 115 mc. logarithmic amplifier. The amplifier handles a 35 power range and the bandwidth is 300 Kc. An X-band wavemeter furnishes frequency calibration accurate to ±5 mc. over the full signal range.

PB 15125. U. S. NAVY DEPARTMENT. BUREAU OF AERONAUTICS. Handbook of maintenance instructions for Model TS-323/UR heterodyne frequency meter and crystal calibrator. (AN 08-35 TS323-2). 1945. 74 p. Price: Microfilm-$1.00 - Photostat-$5.00
This handbook describes Model TS-323/UR heterodyne frequency meter and crystal calibrator. Information concerning the installation, operation, adjustment, complete maintenance and overhaul of the equipment is included. It is used to provide a simple, accurate, and reliable means for adjusting radio transmitters and receivers to any desired frequency in the range from 20 Mc to 450 Mc, as well as a means for measuring the frequencies of external signals. Under service conditions the equipment is capable of accuracies of 0.01 percent within its frequency range at any temperature from zero to plus 50 degrees Centigrade (32°F to 120°F). An accuracy of 0.005 percent is obtainable under fixed conditions at room temperature. Parts list, photographs, diagrams, and graphs are included. Published under joint authority of the United States War and Navy Departments and the Air Council of the United Kingdom.

PB 14796. U. S. NAVY DEPARTMENT. BUREAU OF SHIPS. Final instruction book for Navy Model LS-1 squadron signal generator, airborne radio equipment. (NavAer 08-55-71). 1942. 35 p. Price: Microfilm-50¢ - Photostat-$3.00
The Model LS-1 squadron signal generator is a portable self-contained unit designed to generate and transfer a suitable signal to permit a uniform adjustment of the Type 46120 glide path receiver units which are a part of the Model 2A aircraft radio instrument landing equipment. Photographs, parts list and diagrams included. Manufactured by Meissner Manufacturing Company, Mt. Carmel, Illinois.

PB 18554. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. Pedograph M1. (Tech Bulletin ENG 63). Feb 19, 1945. 42 p. Price: Microfilm-50¢ - Photostat-$3.00
This bulletin prescribes the operation, use, and maintenance of the pedograph M-1. It also describes security measures to prevent its detection and capture by the enemy. The pedograph is a course-recording instrument providing a scaled graphic trace of the distance and magnetic directions traveled from a reference point. This trace represents the movements of the person carrying the device. Bulletin contains sections on: Description of pedograph; employment; operating procedure; and maintenance. Photographs, drawings, and graphs.

PB 11485. U.S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Engineer Board Letter report: Gyroscope, directional, Model K-E-v-0754. (Rpg. 2243 and 2244), Feb 16, 1945. 5 p. Price: Microfilm - 50¢ - Photostat - $1.00
This is a description and evaluation of a German directional gyroscope. It is of a conventional type, but of such a design as to be rugged enough for operation in armored vehicles. There is no direct counterpart of U.S. equipment for use in armored vehicles, but this general class of instrument has long been used by the United States in aircraft. The Engineer Board had currently a project for the development of a directional gyroscope similar to this German instrument for use in U.S. armored vehicles. Three photographs.

PB 18766. U. S. WAR DEPARTMENT. SIGNAL CORPS. Spotting sets PH-32-B, PH-32-C, PH-32-D, and PH-32-F, and spotting set AN/TVQ-1. (Tech Manual TM 11-434). Dec 1945. 197 p. Price: Microfilm-$2.00 - Photostat-$14.00
These spotting sets are portable assemblies of equipment each of which is capable of measuring the vertical and horizontal angles at a point from two positions, and making motion picture records of that point with the angular measurements and a time identification included in each picture. The set also contains equipment for processing the exposed films and exhibiting the finished films to be viewed for plotting purposes. The AN/TVQ-1 set is used in the equiangular method of antiaircraft practice where the gun fires at a point in space instead of directly at target, while the other models are used in a antiaircraft artillery practice to photograph the target and the shell bursts from the gun fire. Instructions on the installation operation, maintenance and repair of the equipment are given. This is followed by similar instructions for the AN/TVQ-1 equipment. The film developing components of all the sets are described and operating, maintenance, and repair instructions are given for developing components. The last section of the manual describes film reviewing components and gives necessary instructions for the units. References, photographs, block, circuit and schematic diagrams are included.

## MACHINERY (EXCEPT ELECTRICAL)

German

PB 17373. Nora M62 1939. BOSCH, ROBERT A. G., STUTTGART. Bosch (Standards at Bosch) (MIS VII 69b 7000506) 200 p. Price: Microfilm - $2.00 - Photostat - $14.00
This German document contains piecework standards on various machines as set up at the machine manufacturing firm Robert Bosch, A.G.

PB 7460. May 1944. THE BROWN BOVERI REVIEW, VOL. XXXI No. 5, May 1944. 13 p. Price: Microfilm - 50¢ - Photostat - $1.00
This Review is a monthly publication by Brown Boveri & Co., and covers a variety of subjects. In this issue for May 1944 appears the following articles: a) Medium frequency power in industry; b) Overspeed test plants at The Brown Boveri Baden Works during the last thirty years; c) The statical stability of a network with a number of synchronous machines; d) Present-day possibility of the combustion turbine; e) Important orders for boiler house motors; and f) New high-speed synchronizer. Photographs and diagrams are included.

PB 16859. CLAXTON, EDMUND. German linoleum and hard surface floor covering industry. n.d. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This report consists of diagrams, sketches and photographs illustrating the German linoleum industry. It supplements PB 6348, listed on page 669 of this bibliography. A series of line drawings shows the following: Linoleum primary mixing device; granite-calender feed; linoleum smoothing equipment; standard linoleum calender; Delnenhorst variable speed ratio calender; and Eck "Universal" calender. A diagram and a photograph of the Bergstorff continuous vulcanizing machine; a blueprint of the Eck four-roll "Universal" calender; and photographs and sketches of the Eck "Universal" calender complete the report. The line drawings will reproduce well. The other material probably will not reproduce well.

PB 16081. DAIMLER-BENZ, A.G., MANNHEIM, GERMANY. "Mercedes-Benz" - Dieselmotor type "M98". Jun 1939. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
A blueprint of the Mercedes-Benz Diesel motor, type M98.

PB 16077. DAIMLER-BENZ A. G., MANNHEIM, GERMANY. Mercedes-Benz Dieselmotoren für schnelle motor boote, für Fahrzeuge der gewerblichen Kleinschiffart und Klein Lokomotiven. (Mercedes-Benz Diesel Motors for fast motor boats, for small merchant ships, and for small locomotives) n.d. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
These four sales bulletins cover various types of Diesel engines. The first bulletin gives data on four and six cylinder light and fast boat motors as well as medium fast motors. The second bulletin cover 15-100 HP small ships motors and describes the advantages of the new pre-injection chamber. The third bulletin contains three outline drawings of Diesch motors. The fourth bulletin contains seven illustrations of light locomotive Diesel motors, and four illustrations of boat motors.

PB 16080. DAIMLER-BENZ A.G., MANNHEIM, GERMANY. Vierzylinder - Mercedes Benz Bootsdieselmotor Typ BM 204 mit Rahmen und Wendegetriebe. (Four cylinder Mercedes-Benz Dieselmotor, for boats, with frame and reverse gear). Oct 1945. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
A blueprint of a four cylinder Diesel motor with frame and reverse gear for use in boats.

PB 16079. DAIMLER-BENZ A.G., MANNHEIM. Zweizylinder Mercedes-Benz-Dieselmotor. (Two-cylinder Mercedes-Benz Diesel motor). Jan 1944. 52 p. Price: Microfilm-$1.00 - Photostat-$4.00
This document is a parts-list of the two-cylinder Mercedes-Benz Diesel motor type M-202, and gives their code numbers for the benefit of customers who wish to order them by wire. Photographs of the engine and its component parts are included.

PB 17365. EISENWERK ROTHE ERDE D.m.b.H, DORTMUND. Kugeldrehkranz für Anlage Wurzburg (Ball bearing for the project Wurzburg) (MIS 67 c 7002461). 1944. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This collection of documents deals with the question of replacing an apparently unsatisfactory ball bearing with a fully satisfactory one. Drawing of the ball bearing for the Wurzburg project is enclosed. The bearing in question is a thrust-bearing of approximately 36"OD.

PB 15012. ENDRES, W. Der zeitliche verlauf der verbrennung im Otto-motor (the time aspect of the combustion process in Otto engines). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik IV B 3) (Also: Mission, Klotter File 11 D.) Jun 1938. 12 p. Price: Microfilm - 50¢ - Photostat - $1.00
In German. Includes a bibliography and curves.

PB 15010. KÜHL, H. Thermodynamik der arbeitsverfahren, der theoretische arbeitsprozess für den Otto- und Dieselmotor ohne aufladung (Thermodynamics of working processes; the theoretical working process of Otto and diesel engines without superchargers). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik IV B 1) (Also: Mission, Klotter File 11 D) Feb 1938. 18 p. Price: Microfilm - 50¢ - Photostat - $2.00
The two types of engines are treated separately. Graphs and formulae are included. In German.

PB 15014. LUTZ, O. und HILLER, E. Der gaswechselvorgang beim viertaktmotor (the process of exchanging the gasous mixtures in fourcycle combustion engines) (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik IV B 5) (Also: Mission, Klotter File 11 D) Jul 1939. 12 p. Price: Microfilm - 50¢ - Photostat - $1.00
In German

PB 16857. OBERTH, HERMANN. Wood - burning jet unit. (AAF ATSC T - 2 Translation 407). Mar 1945. 24 p. Price: Microfilm-50¢ - Photostat-$1.00
Plan of Dr. von Holt, a section chief of the WASAG Reinsdorf for a wood burning jet unit for anti-aircraft rockets and long range guns. The apparatus is to fly with double or multiple velocity of sound. In front it has an inverted Laval nozzle through which air enters from the outside, and is compressed and warmed by means of the high velocity so that rapid combustion takes place in the combustion chamber. Various fuels and starter methods are discussed. Part II is the calculation of the effective velocity, and Part III calculates combustion pressure in wood burning jet apparatus. Part IV describes test apparatus and test procedures for preliminary use. Curves and two sketches of the unit are appended. The sketches will reproduce poorly.

PB 14757. NITI, H. Uber den Einfluss der exzentrischen Anlenkung der Pleuelstange in Verbrennungsmotoren. (Effect of eccentric linking of the connecting rod in combustion motors). (ALSOS Mission, Klotter File 9 b). Feb 1944. 96 p. Price: Microfilm-$1.00 - Photostat-$7.00
This report is the author's dissertation containing a thorough mathematical analysis of the effect of eccentricity in linking connecting rods in combustion engines. A more rapid calculation than the usual is developed by the use of the Euler equation $e^{\pm ix} = \cos x \pm i.\sin x$ with vectors in the Gauss plane. Practical application of the results is indicated. Includes graphs and drawings. In German.

PB 7486. SCHILLING, A. H. Brown Boveri and Co., Baden, Switzerland. (American Legation, Berri, Switzerland, Report 8). Feb 1945. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
Brown Boveri and Co., Baden, Switzerland, was visited on 17 and 29 January 1945. The purpose of these visits was to determine the extent of the development of gas trubines and allied equipment in the time since interruption of normal commerce with Switzerland. Brown and Boveri built, in the line of mechanical equipment, essentially steam and gas turbines, compressors and gearing of their own design; in addition to which. They operated under a Buchi license to build superchargers for Diesel engines. The present gas turbine development, however, is an outgrowth of the Velox Boiler development which originated about 1932. The factory in Baden is an organizat on of, at present 5,000 persons and serves as the central engineering office for all the affiliate Brown Boveri Companies in Europe, the total number of whose employers is approximately 60,000. The report goes on to discuss gas turbine; ship installations; combustion; gas turbine designed for the German Navy; Velox Boiler; Water brakes; high temperature material; turbines for The Russian Navy, and Velox boiler and turbine for the Japanese Navy. For enclosure, see PB 7457 to PB 7461.

PB 16704. SPOFFORD, W. P. and HUTTON, A. K. "Budenheim" boiler feed water treatment system. (CIOS Rept File XXXII-97, Item 29). Jul 19, 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
Chemische Fabrik Budenheim of Mainz are the originators of this feed water treatment system. W. Huse and Company, Bremen are the marine licensee. Working instructions as translated from the German are included in this report, but illustrations and drawings are missing. These instructions cover the erection of apparatus and pipe lines, calculation of required trisodium phosphate and operation control, and cleaning of equipment. One distinct difference from American practice is that instead of a Deaerating Heater for deaerating and hot well, the Germans use a cascade heater for deaerating and a hot well for containing recirculated water, filtering, receipt of drains, etc. Investigators state that German scheme has definite advantages for small ships.

PB 32463. TURNER, A. G., MASCHINENFABRIK, FRANKFURT, A.M. Gerbereimaschinen (Tanning machines); supplement to PB 3878, "A report on German tanning machinery", by G. A. Rothschild, FIAT Report 459. n. d. 138 p. 138 p. Price: Microfilm-$1.50 - Photostat-$10.00
This report is a complete sales promotion catalog (in German) covering Tanning machines manufactured by Turner, Frankfurt am Main, Germany. It is a supplement to PB 3878 entitled "A report on German tanning machinery", page 269 of this Bibliography. Photographs and drawings are included.

United States

PB 17700. U. S. NAVY DEPARTMENT. BUREAU OF YARDS AND DOCKS. General instructions for the operation and maintenance of central power plants, United States Navy Yards and stations. (Revised) Chapter 21 of the Bureau Manual. 1942. 73 p. Price: Microfilm - $1.00 - Photostat - $5.00
This pamphlet is a reprint of chapter 21 of the Bureau Manual issued in this form to the readily available to all personnel concerned. The chapter discusses the supervision of the plant to insure a satisfactory supply of power. The various kinds of equipment are described and their operation is discussed in detail. Plant maintenance and safety are also treated. Curves showing operating schedules are given in graphs appended to the pamphlet.

PB 18551. U. S. WAR DEPARTMENT. CHEMICAL WARFARE SERVICE. Valve replacement mechanism, M1. (Tech Bulletin 3-255-1) Jul 1944. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
This directive covers description, operation, and maintenance of valve replacement mechanism M1. It is used to replace faulty valves on type A 1-ton containers which are fitted with Chlorine Institute valves or Liberty valves, Mark II. It should always be used when pressure in the container exceeds 50 pounds per square inch. Included are photographs and diagrams showing the assembly and disassembly of the parts of the mechanism.

## MEDICAL RESEARCH AND PRACTICE, INCLUDING CLINICAL APPLICATION OF DRUGS AND PHARMACEUTICALS

German

PB 16793. DÖRING, H. and KÖNIG, H. Apoplexy from decompression. n.d. 24 p. Price: Microfilm-50¢ - Photostat - $4.00
This decompression apoplexy is caused by aero-embolism in the brain. Since this can end with death, animal experiments were carried out on this topic. The air carried to the brain does not develop in the tissue fluids or in the tissues, as is the case in gas-emboli of decompression disease (aero-embolism of American investigators). Rather it is forced from the lungs into the circulatory system while the respiratory passages are closed. According to this explanation, decompression apoplexy is no more an incalculable danger for the stratospheric aviator. It can not occur if the respiratory passages are open. In conclusion, directions are offered for the crew and it is demanded that oxygen be inhaled in the combat area and that the positive pressure in the chamber be lowered. Charts and tables and a bibliography are given.

PB 16787. LUTZ, W. Concerning the reversibility of cold caused "death" of warm-blooded animals. n.d. 20 p. Price: Microfilm - 50¢ - Photostat - $2.00
This is a translation from a German article and is lacking all the tables and figures mentioned in the text, the translation not being too coherent. Experiments reported are the continuation and at the same time completion of former experiments, by W. Lutz and coworkers, and the cause and nature of death resulting from exposure to cold using guinea pigs as the experimental animal. Because of unknown reasons they did not succeed in detaining the same results with rabbits. The animals were exposed to cold baths until apparent death occured after which at varying lengths of time and under varying conditions they were rewarmed and the cause of delayed death was studied. The following conclusion is drawn: Apparently, the reversibility of the cooling off phenomena is less in respiration than in metabolism and is dependent especially on the body heat. It appears that this contains a very important point for revival from cold. Thereby, the reason for the slower reaction of the respiration to the application of warmth cannot be sought only in that the head and the respiratory center are deficient in heat supply when warming in a water bath. It is also present in preferred warming of the head-parts as Wendt and Ruppin could not obtain could not obtain any special success by cervical cord diathermy. We have the impression that the spontaneous respiration returns independently of the temperature, if there is a well functioning circulation present, which again supposes sufficient lung aeration (artificial respiration) or other insurance of oxygen supply excess oxygen pressure). The dominant role of artificial respiration in the whole revival problem may be based on similar reasons also relative to other kinds of death.

PB 16785. LUTZ, W. On the nature and cause of stopping of the heart upon extreme cooling. n.d. 14 p. Price: Microfilm - 50¢ - Photostat - $1.00
The beating of the heart stops with increasing extreme cooling because the beating intervals gradually lengthen to an infinite length while the heart still retains excitability. The stopping of the heart in the cold is to be considered as a completely physiological phenomenon. Rising oxygen pressures displace the tendency of the heart to stop in the direction of lower temperatures. Photostats of charts and bibliography are attached.

PB 16784. LUTZ, HABIL W. Summarizing report covering scientific activity. n.d. 21 p. Price: Microfilm - 50¢ - Photostat - $2.00
This report consists of a short personal history of Dr. H. W. Lutz who was associated with the Institution for Aviation Medicine at the University of Munich; a bibliography of the subject's scientific work not connected with military medicine; brief summaries of his research on the physiology of altitude, on extreme cooling, and of an industrial constructive and miscellaneous nature. This latter group included: 1. A decompression suit for aviators in pressure cabins (German patent L 105992 V/61a, Nov 13, 1944); 2. Collecting apparatus for expirated air in U-chambers (German patent 761 911, Oct 10, 1942). Among his finished works are: "On evaluation of oral cholecystography", "Survival time after decompression to the highest altitude", "On the nature and cause of stopping of the heart upon extreme cooling", "Control of parachute jumping by flow meter", "General directions for behavior in case of electrical accidents (apparent death)" by Lutz and Mers. Experiments and manuscript are finished covering his work, " On the reversibility of death by cold;" but it still lacks figures and tables. A page in German from subject's manuscript on "Animal experiments preparatory to parachute jumps from pressure cabins" is attached, but no other attachments or appendices are included.

PB 18392. MITTEILUNGEN DES REICHSFORSCHUNGSRATES - Medezin Jahrgang 1944/1945. Heft Nr. 1. (ALSOS Mission, MFR 714). Dec 1944. 43 p. Price: Microfilm - 50¢ - Photostat - $3.00
This publication was issued to acquaint Germans with scientific advances, in foreign countries, in the fields of medicine, chemistry, physics, and mathematics. This number deals with several phases of medicine in the U. S., England and other parts of the world. Brief review articles include work on the electron microscope, blood plasma and blood substitutes, extraction, purification and use of penicillin, local treatment of wounds, and the therapeutic effects of the diamidines for the protozoan infections of humans and house pets.

PB 4510. ROSE, EUGENE L. and WEAVER, ALFRED B. German alkaline eye salve for gas casualties. (CWS Foreign Material Tech Rept 91) Sep 1944. 5 p. Price: Microfilm - 50¢ - Photostat - $1.00
This report covers the examination and testing of 15 identical aluminum tubes containing alkaline eye salve. Chemical analysis is given. The ointment acts only as a soothing agent and is based upon a standard well known formula. A photograph of the tube is included.

Japanese

PB 18634. U. S. ARMY TECHNICAL INTELLIGENCE CENTER, TOKYO. Japanese medical equipment: Hospital, field. (Rept 165) Jan 1946. 13 p. Price: Microfilm-50¢ Photostat-$1.00
This hospital unit would correspond nearly to the collecting company of our Medical Battalion. The equipment is poor, is not compact and cannot be handled easily. It is probable that no definitive treatment could be furnished by this unit other than debridement and temporary splinting prior to evacuation of the wounded. The lack of material for the treatment of shock is striking. This unit is made for vehicle transportation. It is considered to be of no intelligence value other than to compare with the corresponding U. S. Army Medical Unit. An inventory list of each chart accompanies this report and two photographs are included.

PB 18635. U. S. ARMY TECHNICAL INTELLIGENCE CENTER, TOKYO. Japanese medical equipment: Tourniquets, Japanese, four types. (Rept 170) Jan 1946. 3 p. Price: Microfilm - 50¢ - Photostat - $1.00
Four types of Japanese tourniquets are described, two of which can be operated with one hand by the wounded individual. Type 2 and type 3 are of no importance and could not be operated with one hand by a wounded person. Included in the kit is a piece of red cloth 2" x 60" with a ½" wide white stripe down both sides. It is used to identify those individuals who must have their tourniquets released periodically. A photograph of the kit is attached to the report.

United States

PB 18325. ADAMS, J. K. and others. The influence of the visual tasks required of personnel in the 16 weeks fire controlmen (O) training course upon their visual proficiency. (Applied Psychology Panel: Selection and training of rangefinder and radar operators. Rept 7) (NDRC Applied Psychology Panel Rept 271. OSRD Rept 3970) Aug 1944. 29 p. Price: Microfilm - 50¢ - Photostat - $2.00
An investigation was made to discover if the work with optical instruments and with oscilloscopes had an injurious effect upon visual functions. The testing was done at the Naval Training Schools, Fort Lauderdale, Florida with a group which spent a large number of hours of practice on stereoscopic trainers and rangefinders, on tracking telescopes, and on radar oscilloscopes in the course of their 16 weeks course of training as Fire Controlmen. Measures of visual acuity (far and near vision), vertical phoria, lateral phoria, stereopsis, and color vision were obtained with the Bausch and Lomb Ortho-Rater and an additional measure of stereopsis was obtained with the Multiple Projection Ekonometer (stereo vertical test). These measures were obtained at the beginning and again at the end of the 16 weeks course. It was found that: (1) There is no deterioration of any of the above visual functions as a resultof this training; (2) there is a slight improvement in visual acuity scores for right eye and for worse eye; (3) there is an improvement in stereopsis score on both the Ekonometer, stereo vertical, and the Ortho-Rater; (4) there is an improvement in color vision score on the Orth-Rater.

PB 18324. ADAMS, J. K. and others. A test-retest reliability study of the Bausch and Lomb ortho-rater with naval personnel. (Applied Psychology Panel: Selection and training of rangefinder and radar operators. Rept 6). (NDRC Applied Psychology Panel Rept 270. OSRD Rept 3969) Aug 1944. 36 p. Price: Microfilm - 50¢ - Photostat - $3.00
This memorandum is a report on the reliability of test-retest results of the occupational vision tests with the ortho-rater. The Bausch and Lomb ortho-rater tests include measures of far and near visual acuity, for both eyes and for each eye separately; measures of vertical and lateral phoria, far and near; a static depth test (stereopsis) and a test of color vision. The tests and retests from which the data in the study were derived were administered to candidates for training as fire controlmen at the Naval Training Center, Sampson, New York. Due to the homogeneity of the sampling, the usual correlation study of reliability is difficult to interpret and, therefore, other statistical techniques were used. Analysis of the test-retest results indicate that: (1) The Ortho-rater-tests are sufficiently reliable as testing devices in the selection of candidates for training as Fire Controlmen-Rangefinder Operators; (2) although significant differences between the means of several visual acuity tests do occur, the average differences are small and the standard errors of estimate for these tests are small enough to assure an acceptable high degree of accuracy in predicting scores on retests from scores on the original tests; (3) the far and near point tests are of equivalent reliability; (4) the signs of the coefficients of correlation are reduced by the homogeneity of the sample.

PB 11342. BOWERS, RUSSELL V. and others. The effects of strychnine convulsions on the recovery rate in rabbits exposed to phosgene. Nov. 23, 1942. (CWS ND (RA) Memo Rept 73) 1942. 7 p. Price: Microfilm - 50¢ - Photostat - $1.00

The object of this work was to observe the effects of exertion produced by convulsive doses of strychnine on phosgene gassed rabbits. The exertion did not increase the mortality rate and the therapeutic benefit from the increased rate and depth of respiration is suggested but not definitely determined.

PB 18832. COWGILL, GEORGE R. Effect of substitution of lead silver for tin lead solder on canned foods. Progress Report, Feb 19, 1943. (War Metallurgy Committee Research Rept M-15) Mar 1943. 7 p. Price: Microfilm - 50¢ - Photostat - $1.00
This progress report of work done by Yale University under contract with the War Production Board, indicates that rats, fed an artificial diet containing quantities of lead and silver, are being ashed and then analyzed. A method of feeding pellets in lumps of butter was found easier than the use of the stomach tube.

PB 18425. DRUMMETER, L. F. Jr., and others. CWS contract W-49-057-CWS-18 with the Medical Division CC-CWS (Edgewood Arsenal; Final report. Dept of Physics, The Johns Hopkins University). Jan 1946. 38 p. Price: Microfilm-50¢ - Photostat-$3.00
The report is grouped in four sections:
I. Flame Attack Section
(a) Preliminary studies and consulting work.
(b) Gas analysis measurements.
(c) Pillbox temperature measurements.
(d) Physiological measurements.
II. Gassing Chamber Section
Adapting instruments for the analysis and measurement of concentrations within the chamber.
III. Clinical Research Section
Development of an instrument for producing reproducible contact skin burn and recording the amount of energy delivered to the burned area. Development of a thermocouple unit for measurements in a high temperature oven.
IV. Pharmaceutical and Equipment Section
Study of physical properties required of burn protective ointment, development of ointment, the design and construction of an instrument for determining their relative effectiveness.

PB 18796. KAISER, HERMAN F. Report on radon leakage from Navy capsules. (Naval Res Lab Rept M-2036) Jan 1943. 22 p. Price: Microfilm - 50¢ - Photostat-$2.00
This report is concerned with a series of field and laboratory tests which were carried out to determine the extent of radon leakage in radium capsules owned and used by the Navy for gamma radiographic inspection. The majority of the capsules tested showed leakage to a greater or less extent. Tests were carried out to determine the best means of sealing leaking capsules in steel cartridges. These showed that this may best be done by solder sealing the steel cartridges. The internal cavity of the cartridge must be kept to a minimum to avoid loss of radiographic definition.

PB 13663. MARQUARD, C. B. and others. The use of 3 percent hydrogen peroxide in the first-aid treatment of liquid lewisite burns of animals. (CWS MD (RA) Memo Rept 45) Feb 1942. 24 p. Price: Microfilm - 50¢-Photostat - $2.00
The object was to determine the efficacy of treatment when the treatment was delayed for short intervals. In the treatment of rabbits, 3 percent peroxide was found very effective in decreasing the area of injury if used within 12 minutes. If used after 12 minutes, the 3 percent solution was very efficacious in saving the lives of animals. In the treatment of rats, the results were even more striking. The 3 percent solution prevented vesiculation even if treatment was delayed 60 minutes. It is suggested that 3 percent hydrogen peroxide solution replace the sodium hydroxide-glycerine solutions for the treatment of liquid lewisite burns and further tests be made with 8 percent and higher concentrations of hydrogen peroxide.

## METALS AND METAL PRODUCTS

German

PB 14727. BARDENHEUER, PETER. Entwicklungsarbeiten über die erzeugung von weicheisen und fuhrungsringen aus weicheisen. (Kaiser Wilhelm Institut fur Eisenforschung) (Investigative work on the production of low-carbon steel and of guide rings therefrom). (ALSOS Mission, Rept file 121). May 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a short statement on the production of low-carbon steel and on the manufacture of guide rings bands or driving for field pieces, the technique of which was initially started in 1917 and research resumed in 1940.

PB 14543. BORDMANN, K. Knicken von ebenen und räumlichen Stabsystemen (Cracking of rod-structures in plane and space systems). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik II A 7). (ALSOS Mission, Klotter File 11 B. The author simplifies the examination of the stability of a rod-structure by first analysing a group of rods and then checking the stability of several groups. The second part of the report dealing with calculations contains formulae by Cassens and curves by the author. In German.

PB 22343. DEUTSCHE PULVERMETALLURGISCHE GESELLSCHAFT M.B.H. Die herstellung von eisenpulver in tunnelofen (Zusammenfassende darstellung über den gegenwärtigen stand des verfahrens. Angefertigt für Fiat-Höchst) (The production of iron-powder in a tunnel kiln). Supplement to PB 20843, FIAT Reel M4-118, "Patent applications and descriptive treatises on powder metallurgy". Jan 1946. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This report gives a brief description of the history of producing iron powder, starting with the technically and economically inefficient Hametag-process by which an iron wire was cut into pieces. A step forward was the development of the centrifugal-process in which a liquid stream of iron was quenched in steam or by a water-cooled rotating disk. However, this process required the later reduction of the powder for use in metal ceramics, since a certain degree of oxidation was unavoidable. An extensive service test for developing the most advantageous way for the reduction of such oxidised iron powder was conducted in the 50 m long muffle tunnel kiln, type Dressler, of the Norddeutche Steingutfabrik in Bremen-Grohn which was designed for the production of tile and fired with generator gas. The oxidized iron powder was put into refractory containers mixed with layers of charcoal or peat-coke. These containers were piled on trucks which in turn were slowly pushed through the tunnel. The tunnel was filled with gas of high carbon monoxide content to avoid oxidation of the powdered iron. The generator gas made from coke was used for this purpose. The test proved that a production of 500 tons per month of regular iron powder or 105 tons per month of porous iron powder could be reduced in this kiln at identical total cost and reduction to 98-99% were obtained at temperatures between 940 and 1100° max. The product was obtained in powder-blocks which were easily disintegrated. The result of the service test was that the prototype of a system had been found which was economical and furnished a well reduced powder.

PB 18156. FERGUSON, J. R., and HERRESHOFF, A. G. Inspection of German pisten manufacturing plant at Bad Connstatt, Germany. (AAF Tech Intelligence Rept F-30) Jun 1945. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
Half the pistons used in Germany were manufactured in this plant. Airplane and submarine pistons were made here. Pistons were made from permanent mold castings and pressings. The piston skirt was coated with graphite to prevent scoring which they consider better than lead or tin plating.

PB 13628. FINK, KURT. Über versuche zum kraftverlauf bein stossartiger beanspruchung (Progress of force in impact strain). (Kaiser Wilhelm Institut für Eisenforschung) (ALSOS Mission, Hoyt File 205) May 1945. 25 p. Price: Microfilm - 50¢ - Photostat - $2.00
This paper describes experiments in measuring the progress of strain waves in steel caused by impact, and performed with a specially constructed testing apparatus. The results of these experiments are shown in graphs and also mathematically analyzed.

PB 14730. FISCHER, WILHELM ANTON. Entwicklung von stählen für leichtmetallspritzgussformen. (Development of steels for light metal die-casting). (Kaiser Wilhelm Institut für Eisenforschung). (ALSOS Mission, Hoyt file 129). May 1945. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Various types of steel alloys are described with percentages of the elements found therein. Temperatures involved in manufacture are also mentioned.

PB 13624. FISCHER, W. A. Thermische wechselbeständigkeit von stählen (Stability of steel against thermal changes) (Kaiser Wilhelm Institut für Eisenforschung) (ALSOS Mission, Hoyt File 278) n.d. 1 p. Price: Microfilm - 50¢ - Photostat - $1.00
This paper describes the arrangement of an apparatus for testing the stability of thermal changes in steel. Interruption of investigations permitted no conclusions.

PB 14739. HENGSTENBERG, O. and JÄNICHE, W. Das Verhalten von weichen unberuhigten Thomas - windgefrischten Austausch - und Siepens - Martin - Stählen bei der Festigkeits - und Kerbschlagzähigkeitsprüfung. (The behavior in stress and notched-bar impact tests of unagitated low-carbon-steel, especially processed basic bessemer steel and open hearth steel). (ALSOS Mission, Hoyt File 12). Aug 1944. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
The study describes comparative tests between a basic bessemer steel with .035% P and a very low carbon content which is being produced as a substitute for open hearth steel with real open hearth steel and ordinary basic bessemer steel. The appendix contains graphs and diagrams.

PB 7910. HITCHCOCK, J. O. The production of bi-metallic strip in Germany. (BIOS Final Rept 84). n.d. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
Report of visits to G. Rau, Pforzheim, and Heraeus Vaccumschmelze A.G., Hanau A.M., producers of bi-metallic strip for thermostatic purposes. Information supplements that in makers' catalogues, etc. and is given in tables, graphs and diagrams. Widespread adoption of manganese steels is noted.

PB 6785. KIEFFER, R. My statements at the meeting of the wolfram-free hard metal committee in Essen on the 8. 7. 1944. (OTIB 2474). n. d. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a summary of supplementary remarks on the examination of various carbide alloys, including substitute alloys for tungsten carbides, other economical alloys and trials with borax and niobium carbides.

PB 13830. MARTZ, H. and LANGE, H. Bericht über die untersuchungen an ferromagnetischen mangan-aluminium-eisen-kohlenstoff-legierungen (Report on the investigation into ferromagnetic alloys of manganese aluminum and carbon). (Kaiser Wilhelm Institut für Eisenforschung) (ALSOS Mission, Hoyt File 225) May 1945. 8 p. Price: Microfilm - 50¢ - Photostat - $1.00
This folder contains a general discussion of ferromagnetic alloys containing $Fe_3$ Al-C and $Mn_3$Al-C compounds, a patent application for ferromagnetic alloys of manganese, aluminum and carbon of definite composition with or without iron, and another patent application for an Fe-Mn-Al-C alloy for high-frequency magnetization materials.

PB 14718. OELSEN, W. Desoxydation von stahlschmelzen mit basischen schlacken (Kaiser Wilhelm Institut für Eisenforschung) (Deoxidation of molten steels with basic slags). (ALSOS Mission, Hoyt file 110). May 1945. 2 p. Price: Microfilm-50¢ - Photostat-$2.00
The process of deoxidation is described in German. This is a carbon copy which will lend itself poorly for reproduction.

PB 7901. POTVIN, R. Vereinigte deutsche metallwerke A. G. Frankfurt (Main) - Heddernheim. (BIOS Final Rept 89). Sep 1945. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
The sand foundries at V.D.M. produced large castings in aluminum and magnesium for Junkar engines, e.g. crankcases and cylinder heads for Ju 211, casings for Ju gas turbine, and pressure die castings for V-1 and rocket projectiles. Tables, site plan, diagram and photographs are included.

PB 18171. ROGERS, E. L. Kugelfischer-Fabriken, Needle, Ball and Roller Bearing Mfg. Co., Schweinfurt. (AAF Tech Intelligence Rept P-14) Jun 1945. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Investigation of this 30 building German plant, its research and production, and processes of manufacturing. Formula for steel used, hardening and superfinish method are given. Forming of teak veneer retainers is touched upon. Testing and chemical laboratories and machinery were found to be very complete and in an excellent state of repair, with the possibility of 90% production in a short time.

PB 18397. ROSE, HERMANN. Bericht über meine forschungsreise nach Deutsch-Südwest Afrike, meine dortige internierung und heimkehr nach Deutschland in zeitraum vom 23. Juni 1939 bis 20. September 1944. (Report on my exploration trip to German Southwest Africa, my internment there and my return to Germany from June 23, 1939 to September 20, 1944). (Inhaltsangabe; II, Bericht). (ALSOS Mission, RFR 311). Dec 1944. 75 p. Price: Microfilm-$1.00 - Photostat-$5.00
The author, a professor of mineralogy, describes his explorations until his internment in July 1940. Until then he had observed the rock formations of various parts of Southwest Africa, visited tin and copper mines, found deposits of semi-precious stones and visited workings of other metal mines. He also lists the faculty of the German School at Andalusia, where he was interned.

PB 18173. SIMPSON, E. C. Report on trip to Langendorf, Wm. Prym Co., Luftfahrtforschungsanstalt. (C.I.O.S. target no. 26/71) (U. S. Strategic Air Forces in Europe. Tech Intelligence Rept P-16) Jun 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The above company formerly manufactured buttons, needles and pins, but when the town of Langendorf was taken this factory was making turbine buckets for the Junkers .004 engine. They had been producing since January 1945 and were manufacturing buckets at the rate of 20,000 per month. The buckets were manufactured of steel, the composition of which is given herein. The initial operation was to punch a disk with a pilot hole in the center from sheet stock. Then following nine drawing operations to form a tube. Three annealing operations were used, the metal being at 1000-1100°C. and water-quenched. The rough ends of the tube were cut off and the tube swedged open at one end. The blade was then shaped by three additional operations and two annealing operations, and the faces were ground true. Other pertinent facts are included in this report.

PB 18785. TESCH, D. E. Tungsten and molybdenum wire. (FIAT Final Rept 413) Dec 1945. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
The German tungsten and molybdenum industry was investigated to determine what developments had taken place in the manufacture of wire for use in lamps and radio tubes. There were no real changes in the methods of extraction of purification of the oxides and metals. The requirements placed on tungsten metal were relatively low as all metal was press-

ed into comparatively small ingots, the maximum size being about 850 grams. The Osram factory had been completely looted, as were all factories except the Radium Electric Company. Diagrams of apparatus and flow sheets of processes are given. Tungsten plants discussed are: Gebruder Borches; Osram Glublampenfabrik; Radium Electric Company; and Metallwerke Plansee. Molybdenum plants discussed are Osram; Metallwerke Plansee; Radium Electric Company.

United States

PB 16599. BERRY, H. Laboratory test of 61-S aluminum alloy hydraulic fittings. (AAF. ATSC Memo Rept EXP-M-51/AD1058, Add. 2) Sept 1942. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
A clarification of Memorandum Report EXP-M-51/AD 1058, which reported tests on swivel type fittings fabricated of 61-S aluminum alloy by the Weatherhead Company. The conclusions of this test might be misinterpreted since no reference was made to the fact that the fittings tested had undergone a forging operation. New recommendations are substituted.

PB 16834. BLASBERG, FRIEDRICH. Directions for using the FBM hard chromium plating baths, no. 1503/1. (AAF ATSC T-2 Translation 388). n.d. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
Directions for preparing and maintaining the baths with concentrated chromium bath salts and Renewal Salt "S" No. 1507. General rules for preparing objects before chromium plating, and protective varnish for parts not to be plated are described. Suspension racks, anodes and auxiliary anodes, and general facts about material to be chromium plated are explained. The mode of operation and methods for retouching as well as pickling to remove old chromium are covered, and a chapter on the use of "BI" Renewal salt No. 1506 is included.

PB 16835. BLASBERG, FRIEDRICH. Hard chromium plating equipment for treating cylinders. (AAF ATSC T-2 Translation 389). Dec 3, 1943. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
Letter from Herr Blasberg of the Gnome Rhone Corporation relative to a German order, on preparation equipment, chromium plating equipment, renewing and cleaning equipment and chromium removal equipment. Two pages are devoted to FBM plating process and properties of chromium deposits. A cost estimate of the component parts of the complete equipment gives a thorough picture of the items needed. It is used to plate the inside of cylinders.

PB 15839. FITTERER, G. R. and O'DONNELL, W. M. Time-temperature-hardness relations in new gun steels. (OD-34-3) Final report, Jan 31, 1945. (OSRD Rept 5491) Aug 1945. 40 p. Price: Microfilm-50¢ - Photostat-$3.00
This report contains the time-temperature-hardness relationships, or the tempering characteristics, for 9 different steels. Two sets of equations have been calculated for each steel from which tempering temperature to give any hardness may be calculated by substituting the desired Rockwell value. One set of equations establishes these relationships for a two hour tempering period, whereas the other set will give a similar useful calculation in the more practical 7-12 hour tempering cycle which is common for 40 and 75 mm. gun tubes. A summary of the tempering characteristics of all steels has been made in a "temperability" chart. From this, if the hardness value is known for a two hour tempering treatment at any temperature, its hardness may be determined for any other tempering time up to twenty hours at that same temperature. Graphs of hardness - temperature relationships and temperature charts are given. This investigation was done under contract at the University of Pittsburgh.

PB 15865. GENEAGER, M. and others. Final report on correlation of laboratory tests with full scale ship plate fracture tests (NS-336). (Off. Sci. Res. & Dev. Rept. 5380). 26 Jul 1945. 24 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes experiments which were devised and equipment which was constructed to investigate the fundamental differences in ship plate quality. The ultimate goal of this study was to establish a laboratory test which would differentiate good ship plate from that susceptible to dangerous fracture. This study was made at the Carnegie Institute of Technology and was to be continued at Pennsylvania State College under National Defense Research Committee Research Project NRC-96. Tables present results of standard V-notch Charpy Impact Test on semi-killed steel, a summary of tensile properties of scaled tests, and graphs are included.

PB 16399. GILLETT, H. W. and McGUIRE, FRANCIS T. Behavior of ferritic steels at low temperatures: Final rept, Pt. I. (War Metallurgy Committee Research Rept W-78). 1944. 134 p. Price: Limited free distribution; thereafter, microfilm-$1.50 - photostat-$9.00
The purpose of these tests was to secure and correlate data on the low temperature behavior of commercial N.E., S.A.E. and similar steels, made under present day conditions for use in clarifying some of the points relating to composition, heat treatment, grain size, hardenability, etc. The tests included notched bar tests, comparing the V-notch versus the round notch. The report consists of data assembled by the University of Kentucky, where the experimental work was carried out, plus information from other sources. Graphs, diagrams, tables and 51 references are included. This work was done under contract at the University of Kentucky, discussing the subject; for Part II, presenting data and figures, see PB 16398. Earlier progress reports are given in PB [illegible] and 16401.

PB 16398. GILLETT, H. W. and McGUIRE, FRANCIS. Behavior of ferritic steels at low temperatures: Final rept. Part II. (War Metallurgy Committee Research Rept W-118). Jun 1944. 160 p. Price: Limited free distribution; thereafter, microfilm-$2.00 - photostat-$11.00
Data and figures are presented on the low temperature behavior of commercial N.E., S.A.E. and similar steels. Photographs, graphs and tables are given. This is Part II of a final report under contract with the University of Kentucky. For Part I, the discussion, see PB 16399, for progress reports see PB 16400 and 16401.

PB 18811. GROSSMAN, M. A. Hardenability of steel. Progress report, Dec 8, 1943. (War Metallurgy Committee Research Rept W-84) Jan 1944. 86 p. Price: Microfilm-$1.00 - Photostat-$6.00
The main purpose of this report is to describe a means of estimating the hardenability of a steel from its chemical composition, or of calculating compositions that would provide a desired hardenability. Added to this report is a report giving hardenability data on eight elements from the Union Carbide and Carbon Laboratories, and also a partial report from the Naval Research Laboratory, Anacostia Station on "The Effect of alloying elements on the hardenability of steel," which gives information relative to hardenability factors of sixteen elements. Tables, diagrams and graphs are included.

PB 18391. HOLLOMON, JOHN H. and JAFFE, LEONARD D. The metallurgical design of steels for optimum mechanical properties. (Watertown Arsenal Lab Rept WAL 320/28) Oct 1945. 225 p. Price: Microfilm-$2.50 - Photostat-$10.00
The primary metallurgical problem connected with guns, armor, projectiles, and many other ordnance parts is the design of steels and heat treatments that will produce the optimum combination of mechanical properties. It is now possible to establish a design procedure that will insure the optimum combination of mechanical properties for these parts, but many of the data and principles for performing the actual design have not been established. In this report the known information is reviewed and assembled, and the deficiencies in the knowledge are pointed out. From this assembled information scientifically sound metallurgical design principles are established. A hypothetical example utilizing these principles is also presented. Charts and photographs are included as well as full bibliography.

PB 18794. JACKSON, CLARENCE E. Report on weldability tests of high tensile steel (Lukens Steel Company), Feb 9 to Feb 19, 1944. (Naval Res Lab Rept M-2237. NAVSHIPS Welding Test 336) Feb 1944. 36 p. Price: Microfilm-50¢ - Photostat-$3.00

Four steels of the manganese titanium-treated type have been studied as to their relative weldability. All four steels showed cracking in the heat affected zone. It is suggested that this behavior is due to the fact that the weld deposit has a much higher transformation temperature than the base metal. It was concluded that the four samples were unsatisfactory using one brand of Navy Grade 1 (AWS E6010) mild steel electrode. Further work is underway at the Laboratory in order to demonstrate the general validity of this conclusion and to develop a practical remedy for the prevalent cracking of the heat affected zone observed in all steels in this test. References, tables, diagrams and photographs are included.

PB 18815. JACKSON, L. R. and others. Fatigue properties of flash welds: Final report, Jan 15 - Jun 30, 1945. (OSRD Rept W-204) Jun 1945. 43 p. Price: Microfilm-50¢ - Photostat-$3.00

This is the third and final report on W.P.B. Research Project RDC-569, on the Fatigue Properties of Flash Welds. Bending fatigue tests made on flash-welded SAE 4130 steel plates, under conditions in which surface decarburization and extensive outbent-fiber conditions were eliminated, indicated that the flash weld did lower the bending fatigue strength of the plate. Specimens heat treated after welding were weaker in bending fatigue than those heat treated before welding and tested in the as-welded condition. The presence of extensive weld defects lowered the fatigue strength and the endurance limit of some specimens below the values characteristic of good welds. Reinforcement raised the fatigue load-carrying properties of the flash-welded plates. Rotating-beam fatigue tests of flash-welded SAE 4130 steel tubes with very prominent inside flash indicated that for the gages used the joints had not been weakened by the presence of the inside flash. The tubes with the inside flash intact had longer lifetimes under given applied bending moments than tubes of the same outside diameter in which the inside flash and decarburized zone had been removed by machining a 0.038" layer from the inside tube surface. The presence of prominent outbent-fiber conditions lowered the rotating-beam fatigue strength of flash-welded round bars in SAE 4130 steel only slightly below that of bars flash welded with minimum outbent fiber.

PB 4397. KNAMISHU, J. and RICE, T. Polarographic determination of iron and zinc in phosphate coatings. (Rock Island Arsenal Lab Rept 44-576-A). Sep 1944. 26 p. Price: Microfilm-50¢ - Photostat-$2.00

An investigation was conducted to establish a polarographic method for the analysis of phosphate coatings containing iron and zinc phosphates. It was concluded that the procedure described in this report is a practical method for the determination of iron, and zinc in phosphate coatings. The method could be used in the investigation of phosphate coatings to determine the ratio of zinc to iron, and the amounts of the iron and zinc phosphates per unit area, i.e.., density of the coatings. Tables and graphs. An appendix gives results of polarograms on new solutions of iron and on solutions made from coatings of sample .50 caliber machine gun links.

PB 15884. LORIG, C.H. and others. Effects of hydrogen, nitrogen and oxygen in armor plate: Part II. Aluminum nitride as an intergramular precipitate (OD-38-2) Final report, Aug 1942 - Sep 1943. (OSRD Rept 1941) Oct 1943. 46 p. Price: Microfilm-50¢ - Photostat-$3.00

The cause of a peculiar intergranular fracture which followed the primary grain boundaries, even though the steel was fractured after having been twice recrystallized, was investigated. Elongation, reduction of area, and notched bar strength of material subject to the intergranular fracture was found to be extremely low. A very fine precipitate of aluminum nitride which occurs in the primary austenite grain boundaries was determined to be responsible for the intergranular fracture and the corresponding decrease in mechanical properties. Steels become increasingly susceptible to the injurious effects of the precipitate as, (a) the aluminum content is increased, (b) the nitrogen content is increased, and (c) as the rate of cooling after casting is decreased. Less than one pound of aluminum per ton could be tolerated in steel having an intended nitrogen content of 0.015% and cooled at a rate of 30° F. per hour, while with the same nitrogen content, castings 3/4-inch in section cooled in the mold were free from the injurious effects of the precipitate though containing 2 lbs. of aluminum per ton. With a cooling rate of roughly 100°F. per hr., precipitation was found to occur at approximately 1600° F. and solution of the precipitate was effected by reheating to temperatures of 2100° F. and higher.

PB 15887. LORIG, C. H. and others. Effects of hydrogen, nitrogen and oxygen in armor plate (OD-38-2). Progress Report Jan 5, 1943 - Apr 5, 1943. (OSRD Rept 1395) May 1943. 26 p. Price: Microfilm-50¢ - Photostat-$2.00

Gas analyses of 11 pairs of rolled armor plate specimens representing passed and failed plate of similar chemical composition revealed that the plates that failed by back spalling had, on the average, higher oxygen contents than the passed plates or the plates that failed by cracking. In an investigation of a peculiar intergranular or interdendritic fracture sometimes found in cast steels, it was possible to reproduce the fracture appearance by using excessive amounts of aluminum for deoxidation. Increased nitrogen seemed to aggravate the defect, while a decrease in silicon gave a similar effect. A reduction in alloy content decreased the amount of intergranular fracture areas to a considerable extent. Titanium was helpful in preventing the intergranular type of fracture. Photographs of specimens are given.

PB 18795. LUTHER, GEORGE G. Research on the weldability of iron alloys: Weldability tests of silicon-manganese steels. (Naval Res Lab Rept M-2149) Aug 1943. 43 p. Price: Microfilm-50¢ - Photostat-$3.00

An investigation on the effect of silicon content with varying carbon and manganese on mechanical properties and weldability of 24 steels indicates that silicon is to be preferred to carbon or manganese for the production of high strength normalized steels for welding; the silicon steels showed lower weld hardening and higher weld ductility results. References, tables, graphs, diagrams and photographs are included in this report.

PB 16401. McGUIRE, FRANCIS. Behavior of ferritic steels at low temperatures: Progress rept Feb 3 - May 15, 1943. (War Metallurgy Committee Research Rept W-35). Jun 1943. 69 p. Price: Limited free distribution; thereafter, microfilm-$1.00 - photostat-$5.00

Eleven forged steels have been investigated in 39 different treatments for behavior under impact between the temperature limits of -310° and +375°F. The curves of Charpy keyhole impact value vs. temperature are given and it is demonstrated that the behavior is markedly affected by heat treatment. It has been shown in the steels studied that optimum low temperature notch toughness is obtained when the steel is rendered fully martensitic by quenching prior to tempering. The end quench hardenability of each steel has been given. From the data presented safe temperature ranges of operation for each steel can be established. Graphs, photographs and tables are included. This is a progress report from the University of Kentucky under contract with the War Production Board, the project being termed WPB Research Project M.R.C. No. 526. For second progress report, see PB 16400; for final report see PB 16399 and 16398.

PB 16400. McGUIRE, FRANCIS T. Behavior of ferritic steels at low temperatures: Progress rept May 15 - Sep 15, 1943. (War Metallurgy Committee Research Rept W-64). Oct 1943. 110 p. Price: Limited free distribution; thereafter, microfilm - $1.50 - photostat-$8.00

66 curves are presented of notch bar behavior of 29 steels between the temperature limits of -310°F to + 375°F. Some curves obtained with the Izod-notched Charpy specimens are included. Tables, graphs and photographs are given. This is a progress report under contract with the University of Kentucky; for first progress report, see PB 16401 and for final report see PB 16399 and PB 16398.

PB 18817, 18818, 18819, 18820, 18821, 18822, 18823.
MAHLER, G. T. and others. Investigation of the ferrosilicon method of producing magnesium. (War Metallurgy Committee Res Repts W-7, W-14, W-33, W-55, W-70, W-79, and W-102.)

| Progress Rept | PB No. | Date | Pages | Price Microfilm | Photostat |
|---|---|---|---|---|---|
| 1 | 18823 | Jan 1943 | 101 | $1.50 | $7.00 |
| 2 | 18817 | Mar 1943 | 61 | 1.00 | 5.00 |
| 3 | 18818 | May 1943 | 46 | .50 | 4.00 |
| 4 | 18819 | Sep 1943 | 47 | .50 | 4.00 |
| 5 | 18820 | Dec 1943 | 56 | 1.00 | 4.00 |
| 6 | 18821 | Jan 1944 | 24 | .50 | 2.00 |
| Final Rept | 18822 | Apr 1944 | 28 | .50 | 2.00 |

A series of seven reports, six progress reports and a final report, cover the work done by the New Jersey Zinc Company under contract with the War Production Board on the ferrosilicon method of producing magnesium. The work covers the period from August 1, 1942 to December 31, 1943 and the final report was accepted in April 1944. The first report, prepared by G. T. Mahler, L. D. Fetterolf, and E. C. Truesdale, covered the period from August 15, 1942 to November 15, 1942. This report embraces three investigations: (1) Operation of pilot plant to investigate production of magnesium by the ferrosilicon process; (2) laboratory study of the production of magnesium by silicon reduction of calcined dolomite; and (3) laboratory study of wet and dry briquetting of calcined dolomite-ferrosilicon mix. The pilot plant was operated using relatively large briquets made by the wet briquetting method and then the laboratory unit was operated with briquets made by the dry method. As a result of the study the following estimates of the advantages of wet briquetting were given: (1) Ease of briquetting from the mechanical standpoint; (2) high recovery of whole briquets - little recirculation; (3) very high press capacity relative to dry briquetting; (4) superior quality briquets - quality maintained throughout the entire processing; and (5) the feasibility of producing larger briquets than are now being produced by the dry method. The indications are that this increases rate of magnesium reduction in commercial size retorts. The next report prepared by G. T. Mahler and L. D. Fetterolf covers the period from November 15, 1942 to February 15, 1943. The outstanding development during that period was an important simplification of the wet briquet process. It was shown that commercial hydrate was perfectly satisfactory, that a simple mixer may be used for incorporating ferrosilicon and water and that wet briquets (without any drying) may be directly preheated in a rotary kiln. The processing behavior and metallurgical performance of the briquets were in all respects satisfactory. Plant trial of wet process briquets at the New England Lime Company showed at least a 10 percent greater yield per hour from a retort charged with 175 pounds of wet briquets than from a 200 pound charge of dry briquets. Tests on various grades of ferrosilicon indicated that 90 percent grade was very little better than 75 percent grade and that 50 percent grade was decidedly inferior. The third report, prepared by L. D. Fetterolf and G. T. Mahler, covered the period February 15, 1943 to May 15, 1943, and included only material relative to the laboratory study of magnesium production as distinguished from the pilot plant study. Laboratory work has been confined to a study of the various factors affecting the reduction behavior of dolomite-ferrosilicon mixes, both wet and dry process. Investigation of the use of fluorspar as a catalyst to improve silicon efficiency and magnesium yield was prosecuted to the extent that laboratory study was effective. The laboratory work was done on mixes prepared in conformity with good commercial practice and reduced in a small unit duplicating the essential features of a commercial unit. A study of the effect of size of ferrosilicon indicated that silicon efficiency improved at a slow rate with increasing ferro fineness in a dry mix to the point of fineness at which oxidation of ferrosilicon by air became a factor. The effect of ferrosilicon size in wet mix was more pronounced, either very coarse or very fine ferro causing low recovery. It was indicated that residual $CO_2$ in calcine up to 3 percent or so is not harmful to silicon efficiency or quality of the metal deposit. Fluorspar was effective in increasing the silicon efficiency and metal yield from dry mix. The fourth report, covering the period from May 15, 1943 to August 15, 1943, was prepared by G. T. Mahler and L. D. Fetterolf. During this period the pilot unit and laboratory studies of magnesium reduction were continued using both wet and dry process briquetting methods. Wet briquets showed to advantage in terms of efficiency and yield in comparison with select quality dry process briquets. Dry briquets are subject to breakage in handling and in the reduction retort which breakage seriously decreases reduction efficiency. Consistently good recoveries are much more certain with wet process briquets. Briquet size within limits is now believed to be of little importance from the standpoint of final reduction although it may be of importance in so far as it affects breakage. Advantages result from the use of fluorspar with optimum addition of 5 percent. $CaF_2$ and $MgF_2$ have proved to be effective catalysts. The fifth progress report, prepared by G.T. Mahler and L.D. Fetterolf covered the period from August 15, 1943 to November 15, 1943. The pilot unit was operated with standard thickness and diameter alloy retorts and with thin walled alloy retorts carrying cylindrical, silicon carbide refractory inserts. A Duraloy retort of the former type had a life of 212 days with 130 days at 1225°. Two other retorts of different origin failed after a short life by "blow out" during application of air pressure. Promising results followed the addition of 1-5 percent fluorspar to stone before or in the early stage of rotary furnace calcination. Briquetting characteristics of the mix are not impaired and briquet density is increased by 20-40 percent depending upon a number of conditions. Considerable pilot unit work done on Ford Company calcine and supplied Ford Company mix (dry process) indicate that Ford materials are satisfactory and that normal efficiencies and magnesium deposits can be obtained. Pilot unit tests on Wigdale stone were accompanied by some difficulty due to sodium. It is believed that trouble can be obviated by improved design of a hot condenser. Extensive laboratory tests (dry process) on New England Lime Company and National Gypsum Company stones showed that the following factors, varying within wide limits, are without influence in so far as the inherent chemical reactivity of the mix reactants are concerned: (1) Calcination temperature (2) fineness of mix; (3) aging of calcine; (4) aging of briquets. The sixth report prepared by G. T. Mahler and L. D. Fetterolf covers the work conducted between November 15, 1943 and December 31, 1943, the date of the termination of the contract. Continuation of tests on thin-walled alloy retorts with silicon carbide refractory liners showed that the idea may have merit but that SiC is not a suitable refractory because of its reaction with the alloy. A test to determine whether a 3/4' wall, alloy retort might be operated satisfactorily with periodic application of air pressure terminated prematurely - probably as a result of defective casting. Further tests on Permanente stone calcine worked by the wet briquetting process have shown that normal briquet density is obtained providing the stone is calcined with a small amount of NaCl or $CaCl_2$. Dolomites have been calcined with small additions of fluorspar and the calcines worked by the dry briquetting process. The final report for the project, prepared by G. T. Mahler and L. D. Fetterold, gave a brief summary of all of the work done during the period from August 1, 1942 to December 31, 1943 under the contract to investigate the ferrosilicon reduction method of magnesium production. Only descriptions and broad generalizations and conclusions are contained in this report. References are made to the period reports listed above. The work included both pilot plant and laboratory investigations which covered nearly all practical and many theoretical aspects of the problems. A great deal of work was done on briquetting by both wet and dry methods. The advantages and disadvantages of each are given. Calcination studies resulted in the discovery that the addition of fluorspar to stone before calcination may result in greatly increased magnesium yield. Retort size, firing, protection and maintenance were investigated with some useful contributions resulting. Great prolongation of retort life by periodic inflation with air was accomplished. The many factors involved in the reduction process were studied - such as time and temperature of reduction, briquet size, briquet quality, materials sizing, type of dolomite, grade of

ferrosilicon, degree of vacuum, etc. Possible catalysts were tested and advantages of $CaF_2$ in specific cases were established. Improvements in condensation was realized by changes in condenser design and by temperature control. Photographs, curves, charts, and blue prints illustrate the report.

PB 4398. MARCHANT, D. W. A study of the effects of surface recarburization on the torsion endurance limit. (Rock Island Arsenal Lab Rept 44-1898). Mar 1944. 18 p. Price: Microfilm-50¢ - Photostat-$2.00
An investigation was conducted to determine the metallurgical and mechanical effects of the carbon enrichment of a decarburised surface. Tests were made with specimens of WD 9260 steel, made up to fit the RIA torsion fatigue machines. It was found that: (1) Carbon can be satisfactorily restored to a surface whose total and partial decarburization extend to a depth of *.015 - *.020; (2) the endurance limit for unidirectional torsion may be increased 30% by the restoration of carbon in a decarburized surface layer; (3) a carburizing salt bath containing 5.5% sodium cyanide is satisfactory for the surface enrichment of this type of work; and (4) production control of this process would be difficult unless the condition of the decarburized parts could be held reasonably uniform. Tables, photomicrographs, and graphs.

PB 5680. MARTIN, D. W. Endurance test of Allis-Chalmers production turbosupercharger with wheel no. 4203A. (AAF ATSC Memo Rept EXP-M-57-522-168). Sep 1942. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The purpose of this memorandum is to report results of test on an Allis Chalmers production turbosupercharger with wheel no. 4203A which consisted of 17W forged buckets pressed into a 17W forged disc. Exhibits A and B show running logs of the endurance test which revealed that 17W bucket material is inferior to 72 alloy, Hastalloy B, and vitallium bucket material.

PB 5678. MARTIN, D. W. Endurance test of General Electric turbine wheel no. XB11146B. (AAF ATSC Memo Rept EXP-M-57-522-164). Sep 1942. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The purpose of this memorandum is to report results of a test conducted on a General Electric Company, Type B turbosupercharger experimental wheel no. XB11146B, which consisted of 17W disc with arch-welded 72 alloy buckets in conjunction with Ford Motor Car Company compressor casing No. 1. The test which lasted 94 3/4 hour is fully described in Appendix I, Exhibits "A" and "B" show runing logs of the test.

PB 15151. NELSON, R. B. A gold-copper alloy solder. (OSRD Div of Radio Coordination Rept 931-13). May 19, 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
An alloy of 37½% gold and 62½% copper is described which has been found useful in vacuum tube construction. This solder has a melting point intermediate between copper and the silver-copper eutectic. It is also valuable for soldering Fernico to copper and for diffusion seals of copper to copper. Figures listed in the text are not appended to this report.

PB 16770. OBERG, T. T., and CHASMAN, B. The effect of gas porosity and overaging upon the fatigue properties of cast aluminum alloy. (195) (AAF. Eng Div ENG-56-M-249) Jun 1944. 13 p. Price: Microfilm - 50¢ - Photostat - $1.00
Fatigue tests were made on two types of sand cast specimens: (1) standard rotating beams in the "as cast" and machined state and (2) I-beams with the constant stress section in the middle three inches. The second type was tested in the Krouse plate fatigue machine. The stress-cycle data for all specimens, together with their classification and static tensile and fatigue properties are noted. Three appendices give information on materials and procedures used as well as a discussion of the test results and photographs illustrating them. Test data is tabulated and drawings are included.

PB 16622. O'NEIL, H. B. Substitution of riveting for spot welding when fabricating Douglas Part Nos. 1009715, 4045409, and 5045783. (AAF Rept Eng Sect U-EXP-M-51-4741) Mar 1941. 2 p. Price: Microfilm - 50¢ - Photostat - $1.00
Unsatisfactory Report from Hickam Field that spot welding equipment is not available at their station and asking about a substitute procedure. Riveting with countersunk heads is acceptable for carburetor air scoop hot air connecting tube assembly for engine nacelle exhaust I fairing rear support, and for front fixed section tail pipe fairing assembly until spot welding equipment can be obtained.

PB 16126. PLESS, W. A. Tool investigation; 1½ ton (LC) 4 x 4 truck, Ford, ODC #75. (General Motors Proving Ground Project 180-43. Rept PG-2.1630) Jun 1945. 99 p. Price: Microfilm - $1.00 - Photostat - $4.00
This is a final report covering a tool study conducted to determine the special maintenance tools required for the 1½ ton (LC) 4 x 4 truck - Ford. In all, twenty five special tools were selected as necessary, because they were not available in the standard tool sets; they are all shown in one photograph A940.45. Thirty-five other photographs show these tools in actual operation. Appendix A is a copy of the Maintenance Allocation Sheet and Appendix B is a tabulated list of the special tools.

PB 5677. PRICLO, LOUIS A. Centrifugally cast 17-W turbosupercharger wheel. (AAF ATSC Memo Rept EXP-M-57-522-145). Jun 1942. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
The physical properties of a centrifugally cast 17-W steel turbosupercharger wheel, manufactured by the Ford Motor Company was tested. Nine tensile specimens were prepared for the test from parts of a 17-W centrifugally cast turbo-supercharger wheel high speeded to 36,000 R.P.M. in a vacuum chamber to destruction. The results of the physical tests, given in Table 1, indicate that the strength, ductility and hardness of specimens from the cast 17-W steel discs were much lower than the properties obtained from wrought 17-W steel tested under the same conditions.

PB 5679. PRICLO, LOUIS A. Investigation of turbo-supercharger buckets. (AAF ATSC Memo Rept EXP-M-57-522-165). Oct 1942. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
Tests were conducted to determine the hardness and grain size of 17-W alloy buckets received from Allis Chalmers Company and No. 72 buckets received from the General Electric Company. The 17-W buckets were of the short neck and long neck forged type; the No. 72 alloy cast buckets were of the type which is wielded to the wheel. Hardness results and grain size reading are given.

PB 18812. SEIL, G. E. and others. Tests for classifying scrap metals (The copper base alloys). Progress report, Jan 15 - Apr 15, 1943. (War Metallurgy Committee Research Rept W-25) May 1943. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
This report, prepared by E. J. Lavino and Company, consists of (1) specifications assigned to the various types of copper base alloys which are used for scrap remelting purposes; (2) an A.S.T.M. classification of copper, brasses and bronzes; and identification tests for these alloys.

PB 18814. SEIL, G. E. and others. Tests for classifying scrap metals. Progress report, Feb 8, 1943. (War Metallurgy Committee Research Rept W-13) Feb 1943. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
A compilation of simple and rapid tests for the identification of scrap metals of many types is presented in this report. Specific tests are described for detecting carbon, chromium, nickel, manganese, molybdenum, tungsten, vanadium, titanium, and cobalt by spark testing and/or spot testing procedures. In addition, rapid chemical tests are described for sorting metals of the stainless steel, cupro-nickel, aluminum and magnesium alloy types. This report was prepared by E. J. Lavino & Company under contract with the War Production Board. Photographs of spark patterns are given.

PB 16453. SIL, GILBERT and KICHLINE, H. F. A study of the feasibility of nodulizing iron ores in available rotary cement kilns: Final rept July 1, 1943. (War Metallurgy Committee Research Rept W-30). Jul 19, 1943. 45 p. Price: Limited free distribution; thereafter, microfilm-50¢ - Photostat-$3.00

The work described here was undertaken in order to demonstrate the possibility of production of iron ore nodules from iron oxide products too fine for use either in blast or open hearth furnaces. The data was obtained as the result of the War Production Board Contract WPB-50 with the North American Cement Corporation to study the feasibility of nodulizing magnetite concentrates from the MacIntyre Mine of the National Lead Company. Most of the work was done at the Catskill Plant of the North American Cement Corporation located at Alsen, N.Y. The report shows that satisfactory nodules can be prepared in rotary cement kilns. Tables and diagrams are included.

PB 4399. SHOEMASS, T. J., JR. Investigation to find a suitable material for making cast gages. (Rock Island Arsenal Lab Rept 44-4045). Jul 1945. 38 p. Price: Microfilm-50¢ - Photostat-$3.00

Report of investigations to produce a high strength cast iron or steel which can be cast, annealed and hardened in such a manner as to fulfill the requirements of machinability, hardness, and wear resistance necessary in any material to be used for gages. The following composition produces castings which are easily annealed, machined, and hardened: Carbon - 1.50; manganese - .70; silicon - 1.10; phosphorus - .100; sulphur - .050; chromium - .50; molybdenum - .20. The above composition is easily annealed producing a Brinell hardness range of 225 to 250 by annealing from 1500°F for two hours. Longer cycles lower the hardness, increase the amount of temper carbon and improve the machinability. The higher the carbon content, the more difficult it is to produce the balance of elements giving the same results as the 1.50 carbon steel. In all annealing operations the rate of cooling must not exceed 30° per hour in order to obtain good results. Tables and photomicrographs.

PB 16904. SMITH, J. H. and CHEDSEY, WILLIAM R. Survey of literature and industrial practice on precipitation hardening alloys in armor welding (OD-36, (2) and OD-36, (3)). (OSRD Rept 770) Jul 1942. 12 p. Price: Microfilm-50¢ - Photostat-$1.00

This report presents the results of a recent survey of the opinions and practices of both research men and plant operating engineers on "Precipitation-hardening alloys possibly suitable for welding electrode material", and the related subject, "Properties of the known precipitation-hardening ferrous alloys". The survey included a literature research, the visitation of about 70 firms, laboratories and government establishments, and attendance at meetings of the Watertown Arsenal Armor Welding Committee and sub-committees. The appendix includes brief notes made by the authors when they contacted research men in their laboratories and operating men in their plants. A brief bibliography is appended.

PB 15849. TROIANO, ALEXANDER R. An investigation of the metallographic and physical properties of new types of gun steels (OD-34-3). Progress report, Nov 15, 1943. (OSRD Rept 3005) Dec 1943. 36 p. Price: Microfilm-50¢ - Photostat-$3.00

This report describes the results obtained in an investigation of the S-curves and the structural features of steels employed in the production of gun tubes in this country. Eight S-curves of typical gun steel analyses together with their Jominy curves are presented and discussed. Photomicrographs and graphs of dilatometric and hardness data are presented as an aid in the analysis of the S-curves. In addition, evidence is presented to support a new concept of the mode of the intermediate reaction for the steels studied. It is believed that a complete knowledge of the S-curve must precede any systematic study of slack quenched structures for a given steel. The "AR" point for each of the eight steels has been determined under homogeneity conditions of commercial heat treatment. Investigation reported herein was carried out at the University of Notre Dame.

PB 16485. TUCKER, C. W. and others. Residual stress in cold-drawn non-ferrous alloys (OD-25): An X-ray study. Final Report, Part V: Nov 1, 1944 - Feb 15, 1945. (OSRD Rept 4764) Mar 1945. 53 p. Price: Microfilm-$1.00 - Photostat - $4.00

This report covers measurements on finished caliber 0.30 brass cartridge cases made with variations in the contour of the ejection stem used in the pocketing and heading operations and a lot made using the three point primer crimp. These experimental cartridge cases are a portion of those prepared by the Frankford Arsenal Ordnance Laboratory for the study of the effect of practical plant variables on the residual stresses and stress-corrosion characteristics of caliber 0.30 cases. Diagrams, graphs. For other reports on this subject see PB 16424, 16429-30, 16462, 16464, 16484, 16742, 16744, 16761.

PB 16532. U. S. WAR DEPARTMENT. Rigging and sling hand tools. (Tech Manual 5-228) Dec 1942. 197 p. Price: Microfilm-$2.00 - Photostat-$14.00

Part one of this manual is intended to provide a convenient guide for training and operations in rigging. It discusses proper care and use of cordage, wire rope, chains and hooks, slings and guy lines, and hoisting equipment. Part two describes both hand- and power-operated tools giving instructions for their care and use. Photographs and diagrams are included, as well as a glossary of terms.

OSRD 3675

PB 16472. VOLDRICH, C. B. and others. Flash welding of alloy steels for ordnance: Progress report, Oct 15, 1943 - Jan 15, 1944. (War Metallurgy Committee Research Rept 3675) Apr 1944. 64 p. Price: Microfilm-$1.00 - Photostat - $5.00

This fourth progress report of work undertaken at Battelle Memorial Institute, describes tests to determine the static tensile strength of flash-welded joints in 1-½ inch O. D. SAE 4130 seamless steel tubing and in 1/2-inch, 5/16-inch and 1/4-inch SAE 4130 steel round bars which had been heat-treated before welding. Many flash welds in tubing and round bar with prior heat treatment above 165,000 p.s.i. were as strong as the parent material, and most failures come in the unaffected parent metal. However, an appreciable proportion of such specimens failed on the weld line at strengths much lower than that of the heat-treated material, and it was concluded that consistently high joint efficiency could not be realized at the higher heat treatments, unless the quality of the weld-line junction could be improved. Test results suggest that the presence of small "flat spots" does not seriously affect the static tensile strength of the weld joint, except at the higher strength levels. Tables, graphs and photographs included.

OSRD 3689

PB 16471. VOLDRICH, C. B. and others. Flash welding of alloy steels for ordnance: Progress report, Jan 15, 1944 - Mar 15, 1944. (War Metallurgy Committee Research Rept 3689) May 1944. 65 p. Price: Microfilm-$1.00 - Photostat - $5.00

This fifth progress report presents the results of a preliminary study made at Battelle Memorial Institute to determine the fatigue-strength characteristics of flash-welded joints in 1/8-inch SAE 4130 steel sheet. Specimens tested in the as-welded condition, with the weld machined flush with the plate surface, had essentially the same fatigue properties as unwelded specimens which were unmachined. Unwelded specimens which had been ground to remove both the surface irregularities and the decarburized layer, showed marked improvement in fatigue properties as compared with all other specimens used. Fatigue strength of flash-welded specimens, of the size and material tested, is influenced more by the geometry of the weld joint than by the heat effects of flash welding. Tables, graphs, and photographs are included.

## ORDNANCE AND ACCESSORIES

PB 11838. U. S. WAR DEPARTMENT. CHEMICAL WARFARE SERVICE. Foreign and United States facepieces. (CWS Field Lab Memo 3-1-4) May 1943. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This mimeograph presents the results of examination, and tests when available, of foreign gas masks and photographs thereof. Descriptions are given in which attention is directed to salient features. Gas masks of the following countries are included in this survey: Germany, Russia, Japan, Italy, Czechoslavakia, France, Poland, Great Britain, and China. Description of the more common types of United States facepieces is also given, with photographs.

### German

PB 16685. ECCLESHALL, D. German CW charging station and CW dump at Espelkamp. (CIOS Rept File XXXII-6, Items 4 and 8.) Apr 1945. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a report of investigation of Heeres-Munitionsanstalt Lubbecke where weapons and vesicant and shell charging houses are stored. This site was started about 1939 and was not completed. The appendix contains a list of C.W. ammunition at H.M.A. Lubbecke.

PB 4508. KASPIN, BEN L. and others. German flame thrower ignition cartridge. (CWS Foreign Materiel Tech Rept 95) Oct 1944. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
The report covers the examination and testing of a box of 25 cartridges for the German flame thrower. The cartridges appear to be simpler to produce than our own and they are recommended for production for our own forces, with an American burning mixture.

PB 16896. SPENCELY, G. K. and others. Skoda Works, Pilsen, Czechoslovakia. (CIOS Rept File XXXI-70, Items 2, 18-19 & 21) n.d. 90 p. Price: Microfilm-$1.00-Photostat-$6.00
A report of investigation of Skoda Works, Pilsen, Czechoslovakia, with separate appendices devoted to (1) a survey of manufacture of ammunition and (2) armament design and development at Skoda Works. There was no evidence that the Germans introduced new methods of steel production or heat treatment during the time that they were in control of the works. The design of a number of novel components is described. These are: An H. E. shell design with a long ballistic cap, stick fuse, and hollowed-out base; a sabot projectile with a front band of plasticized wood and a blow off base carrying a driving band; a base ejection shell filled with discs for anti-aircraft use; and a mortar bomb design with steel fragments surrounding the H. E. filling to increase a fragmentation. Photographs, diagrams, and drawings of guns and equipment are given. A list of armament projects under development or completed for the German authorities is also included.

### United States

PB 15769. BECKER, L. W., JR. Test impregnation in a modified Martin dry cleaning unit. (CWS Tech Div Memo Rept 501) Dec 1943. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
The object was to develop the best method for impregnating clothing with anti-vesicant impregnate. It was concluded that the Martin Dry Cleaning System had possibilities when certain listed changes were made.

PB 4385. BENSON, F. R. Develop processes for recovery of explosive scrap: Second progress report (Picatinny Arsenal Tech Rept 1287). May 1943. 6 p. Price: Microfilm - 50¢ - Photostat - $1.00
If the use of barium stearate or other metal stearate in the pelleting of tetryl is adopted in accordance with a recent recommendation (Picatinny Arsenal Technical Rept 1261), then considerable quantities of tetryl-metal stearate scrap will be accumulated. Since this scrap is likely to be contaminated with grit or other foreign material, it cannot be reused, and suitable recovery methods must be employed to reclaim the tetryl. Laboratory investigation has shown that tetryl may be recovered in satisfactory yield and purity from mixtures of tetryl and barium stearate or magnesium stearate by extracting the tetryl with acetone and subsequently precipitating it with water. If the quantities of tetryl-metal stearate scrap warrant the recovery of tetryl, it is recommended that this be done by the same procedure now used in the recovery of tetryl from scrap containing graphite. Tables.

PB 5883 BETTS, R. L. and MYERS, H. P. Characteristics of aluminum soap gels of the Napalm type. (OSRD Rept 1345) Apr 1943. 85 p. Price: Microfilm - $1.00 - Photostat - $6.00
This is a progress report under contracts with the Standard Oil Development Company. The report discusses the properties, methods of compounding and methods for testing napalm thickened soaps. Its use in the M69 incendiary bomb and portable flame thrower is also discussed. The appendices describe the Gardner mobilometer and various viscosimeters and extensometer. Tables, graphs and a photograph are included.

PB 15782. DENUES, A. R. T. Firing tables for 4.2-inch chemical mortar M1A1 firing shell FS-M2, HS-M2, WP-M2, and HE-M3, using propellant MV1. (CWS Tech Memo Rept 574) Feb 1943. 35 p. Price: Microfilm - 50¢ - Photostat - $3.00
The simplest form for firing table includes one basic table of range-elevations for FS smoke and WP (white phosphorus) shell weighing about 25.5 lbs., together with practical tables for drift corrections (as functions of elevation) and for differential effects of winds and air density. The same tables of differential effects with ranges increased by 4% apply to HS (mustard gas), HE (high explosive) and CG (phosgene) shell weighing about 24½ lbs.

PB 15776. DENUES, A. R. T. Preliminary investigations and engineering tests to develop increased range for the 4.2-In. chemical mortar by means adapted to immediate field application. (CWS Tech Div Memo Rept 549) Feb 1943. 98 p. Price: Microfilm - $1.00 - Photostat - $7.00
This report records tests made in the use of the current issue propellant MV, of .025 inch web, which proved to be the most feasible means of effecting substantial increases in the range of the 4.2 inch chemical mortar. Drawings and photographs illustrate the report.

PB 15770. FLEGENHEIMER, W. H. Development of a floating smoke pot. (CWS Tech Div Memo Rept 510) Mar 1943. 43 p. Price: Microfilm - 50¢ - Photostat - $3.00
Experiments are described from which it is concluded that it is impractical to use smoke pots as the source of smoke in a smoke float. Models E7R10 and 11 were developed as satisfactory floating smoke pots; in them the smoke mix is pressed into a 5 gallon pail without additional ballast. Tables and drawings illustrate the work.

PB 4381. HART, DAVID. Coating agents for magnesium-aluminum alloy: 2nd progress report. (Picatinny Arsenal Tech Rept 1473). Nov. 1944. 8 p. Price: Microfilm-50¢ - Photostat - $1.00
An improved igniter composition "K" for tracer ammunition was developed containing dichromated 50/50 or 65/35 magnesium-aluminum alloy instead of magnesium. This substitution involves no change in the manufacturing process.

Extended storage tests have demonstrated that it is more stable at elevated temperature and high relative humidity and also less sensitive to friction than standard igniter composition "K". A semi-plant procedure for dichromating powdered magnesium-alloys in 50 pound lots has been developed. It is recommended that if test firings confirm results obtained at this Arsenal, the improved igniter composition "K" be considered suitable for use in tracer ammunition in place of standard igniter composition "K". Tables.

PB 4382. HART, DAVID. Coating agents for magnesium and magnesium-aluminum alloy: First progress report. (Picatinny Arsenal Tech Rept 1403). Mar 1944. 17 p. Price: Microfilm - 50¢ - Photostat - $2.00
A fundamental study of coating agents for magnesium and magnesium-aluminum alloys was made for the purpose of developing one that would (a) improve their resistance to moisture and (b) eliminate the hazard which attends the current practice of coating with linseed oil. An inorganic chromate coating has been developed for powdered magnesium and magnesium-aluminum alloys which is readily produced by immersion in an aqueous solution of sodium dichromate. The dichromated magnesium and magnesium-aluminum alloys formed by this treatment, are more resistant to reaction with water and more stable at elevated temperatures and high relative humidity than the untreated metals as well as those coated with linseed oil and representative samples of high melting point waxes, high molecular weight fatty acids, resins and synthetic plastics. Substitution of dichromated magnesium and magnesium-aluminum alloy in igniter composition "K" and pyrotechnic composition W-2 improved their resistance to reaction with moisture. Further tests are recommended. Photographs and tables. For later report, see PB 4381.

PB 16455. KAPPAUF, WILLIAM E. Suggestions for the design of production models of the mark 15 gun sight and mark 52 director. (NDRC Applied Psychology Panel Rept Jan 1944. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This report lists the suggestions on the design of this gun sight and director made during training by the first two combat crews to man them. A brief description of the background of each suggestion is given.

PB 16456. KAPPAUF, WILLIAM E. Notes on the desired characteristics of trainers. (NDRC Applied Psychology Panel Rept 391) Jan 1945. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
This memorandum on the principal characteristics desired in training devices list three general types of trainers: (1) Trainers which deliver a synthetic signal to a piece of real equipment, as the gunnery trainers marks 3 and 5, the radar trainer mark 1 and the proposed trainer for the gun director mark 57 and 63; (2) trainers which are completely synthetic and which simulate some part or parts of the real situation or the real job, as the gunnery trainer mark 1, and the stereoscopic trainers mark 2, 4, 6, and 7; and real instruments similar to the one on which the real job is later to be performed. The following principles relative to the design and preparation of a trainer were advocated by this memorandum: (a) The trainer must be valid; i. e. it must accomplish real training, as demonstrated by experimental test (b) the trainer must have a scoring device and one which is as reliable as possible; (c) realism of the trainer's scores must be sacrificed when necessary in the interest of obtaining scores which differentiate men and distinguish clearly between different levels of ability; and (d) the trainer situation must be such that there will be little difficulty in motivating men to use the equipment. This report was prepared at the Advanced Fire Control School, Navy Yard, Washington, D. C.

PB 16458. KERMANS, THOMAS G. The design of a tracking head for use on pedestal-type directors. (NDRC Applied Psychology Panel Rept 639) Sep 1945. 18 p. Price: Microfilm-50¢ - Photostat-$2.00
Project M-11, Advanced Fire Control School was concerned with compiling test data on instrument changes which should improve the tracking design of pedestal type directors. This memorandum deals with the special problems of eyepiece height, location of the elevation axis, the desired arc of motion of the eyepiece in elevation, tracking at high angles of elevation, and handle bar design. Experimental data are provided on the particular problem of making the motion of the eyepiece in elevation match the natural arc of eye motion of the tracker as he turns his head to look up. Photographs of gun director, chart of eye movement and schematic diagram of elevating mechanism are given. This memorandum is accompanied by a two-page transmittal note signed by William E. Kappauf.

PB 16457. KAPPAUF, WILLIAM E. Notes on the design of phototube scoring devices for tracking trainers. (NDRC Applied Psychology Panel Rept 521) May 1945. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
In connection with an analysis of the scoring device incorporated in the pilot model of the Gunnery Trainer Mark 5, the following general principles were formulated for the design of phototube recording system designed for use in trainers where a single operator tracks or aims in both train and elevation: (1) The radius of the circle within which the gun is scored as being "on target" should be approximately 1.13 times the average tracking error of the group within which maximum differentiation is desired; (2) the scoring system should be so designed that sensitivity changes are minimized; (3) the radius of phototube aperture and target image should be made equal in order to minimize the effects of scoring sensitivity changes; (4) the initial sensitivity of the system and image brightness should be so adjusted that the area of initially required overlap of target image and aperture is as small as possible relative to the radius of the scoring circle; (5) the reliability of a scoring system should be demonstrated by actual test. These principles were worked out at the Advanced Fire Control School, Navy Yard, Washington, D. C.

PB 16459. KAPPAUF, WILLIAM E. Summary of research on psychological problems in the operation of antiaircraft lead computing sights and directors. Final report, Sep 29, 1945. (OSRD Rept 5425. Applied Psychology Panel Rept 632) Sep 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This report is a final summary of the research work carried on under Contract OEMsr-815 by Project M-111, Applied Psychology Panel. Section I covers engine and history of the project. Section II describes work of the project and outlines what was accomplished in the course of work with the several gunsights and director systems which were studied. Section III lists project's reports and memoranda. Section IV lists project personnel. Section V summarizes the project invention reports. An earlier account (OSRD Rept 3773) describes work accomplished by Contract OEMsr-815 on the Selection and Training of Height Finder Observers.

PB 16175. KOVITZ, JULIUS. Influence of break-up height on performance of AN-M50A2 incendiary bombs in M17A1 clusters. (CWS Tech Div Memo Rept 1098.) Aug 1945. 26 p. Price: Microfilm-50¢ - Photostat-$2.00
The data obtained from the experiments described in this report indicate that the performance of the AN-M50A2 incendiary bomb when released in M17A1 aimable clusters at a constant altitude depends on the height of the cluster break-up. The maximum penetrating effect of the AN-M50A2 bomb was obtained at the greatest height of cluster break-up tested (12,500 ft.). Functioning of this bomb on sawtooth roof industrial buildings is unsatisfactory independent of the height of the cluster break-up. It was recommended that M17A1 clusters be disintegrated at heights above 10,000 feet and that they not be used against targets consisting of light saw-tooth roofed structures. Tables present test data.

PB 17205. McLAIN, J. H. and FRAHM, A. L. A new method of comparing ignition sensitivity of pyrotechnic mixtures. (CWS Tech Div Memo Rept 882) Sep 1944. 24 p. Price: Microfilm-50¢ - Photostat-$2.00

The object was to find a rapid, accurate and reproducible method of determining the comparative ease of ignition and to make this method analogous to the type of ignition in the assembled munition. A method which utilizes an electrically heated filament for contacting the test sample momentarily gave excellent results. The ignition sensitivity was measured by the amount of electrical power (watts) necessary to cause ignition in less than 1/2 second contact. Diagrams, graphs, tables and photographs are given.

PB 15787. MCLAIN, J. H. Pot, smoke, HC, M1: Aluminum-zinc oxide-hexachlorethane filling. (CWS Tech Div Memo Rept 559) Feb 1943. 14 p. Price: Microfilm - 50¢ - Photostat - $1.00
The object of this report was to determine whether an HC smoke mixture containing secondary grained aluminum in place of calcium silicide could be used as a filling mixture in pot, smoke, HC, M1. Suitable mixtures with the aluminum were developed which gave satisfactory performance.

PB 17215. MUNRO, W. P. Colored smokes, fast burning compositions for colored smoke grenades. (CWS Tech Div Memo Rept 751) Oct 1943. 21 p. Price: Microfilm - 50¢ - Photostat - $2.00
The object was to develop compositions which would burn faster (30 secs. or 1 min.) than the M16 compositions, without flaming. Five important ways of achieving very rapid burning of colored smoke mixtures are described here. The combination of potassium bicarbonate with a center hole gave the best all around results for grenades in the 20-30 sec. range. The principles reported are in most cases adaptable to use in other munitions. Tables are included.

PB 15783. ORTYNSKY, R. L. Test of M69 bombs at Huntsville Arsenal, February 4-9, 1943. (CWS Tech Div Memo Rept 576) Feb 1943. 19 p. Price: Microfilm - 50¢ - Photostat - $2.00
This is a report of a test which had as its object the determination of the efficiency of the functioning of M69 bombs filled by the Kilgore Manufacturing Company, Westerville, Ohio, and also to obtain such data as are pertinent to the improvement of the functioning and tactical use of this incendiary bomb.

PB 15781. ORTYNSKY, R. L. Use of napalm in the M69, 6-lb., incendiary bomb. (CWS Tech Div Memo Rept 571) Mar 1943. 10 p. Price: Microfilm - 50¢ - Photostat - $1.00
This is a report of an experiment to develop an incendiary oil from a non-strategic material for use in the various incendiary munitions. Specifically described is an experiment to determine the concentration of soap (X-104) necessary to produce a satisfactory napalm gel for use in the M69 incendiary bomb.

PB 17090. SMITH, B. F. Service test of Navy liquid lacrimator B4, Preliminary tests at Edgewood Arsenal, September 3 to September 6, 1940. (Chem Warfare Serv Tech Div Memo Rept 345) Sep 1940. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
The object was to determine the contamination of certain planes when spraying liquids from the MkV smoke screen tank, to acquaint pilots with the technique of disseminating liquids from airplanes for contamination of targets, and to test the persistence of the Navy liquid lacrimator B4 (70% $CCl_4$ - 30% chloroacetophenone) when sprayed on the Eagle boat. Tables and charts are given.

PB 17297. THOMAS J. W. Protection afforded by canisters against acetylene tetrachloride. (Chem Warfare Serv Tech Div Memo Rept TDMR 1066) 1945. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
Various U. S. Army canisters including M10, M11, M10A1, M9A2 and oil vapor canisters, were tested against acetylene tetrachloride. Test results presented in tabular form indicate that M10, M10A1, M11, M1A2 and oil vapor canisters all provide good protection. The oil vapor canister M1 is particularly satisfactory (when irritant smokes are absent) because its life against acetylene tetrachloride is over three times that of the M9A2, and over five times that of the other three canisters (M10A1, M10, and M11).

PB 15765. THOMPSON, MORRIS. The development of handling equipment for the M33 spray tank. (CWS Tech Div Memo Rept 606) Apr 1943. 29 p. Price: Microfilm - 50¢ - Photostat - $2.00
This report concerns the equipment required to carry the M33 spray tank from the supply depot to the bomb bays of the airplanes in which the tank is to be mounted. Drawings and photographs illustrate the equipment.

PB 17324. U. S. JOINT BOARD ON SCIENTIFIC INFORMATION POLICY. U. S. Rocket ordnance development and use in World War II. 1946. 59 p. Price: Limited quantity available free from OSRD. After supply is exhausted, microfilm copies will be available at $1.00, photostat copies at $4.00
This pamphlet traces the development of the rocket from the time the Chinese launched them against the Mongols in the year 1232 to World War II models. Many photographs and diagrams aid in presenting information on rocket fundamentals, rocket armament for aircraft, rockets for amphibious warfare, ground warfare, and for specialized uses.

PB 15989. U. S. NAVY DEPARTMENT. BUREAU OF ORDNANCE. Aircraft machine gun boresighting kit, Mark 1. (Ordnance Pamphlet 985) Jun 1943. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
Description of the operation, theory, and maintenance of the aircraft machine gun boresighting kit, Mark 1. Diagrams.

PB 15986. U. S. NAVY DEPARTMENT. BUREAU OF ORDNANCE. Blasting caps, and related demolition material. (Ordnance Pamphlet 1411 (prelim)) Dec 1944. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This pamphlet describes some of the correct methods of priming or preparing explosive charges for demolition, with a view to preventing unnecessary injuries and fatalities. It is intended for men already trained in demolitions, and is not an instruction course.

PB 15990. U. S. NAVY DEPARTMENT. BUREAU OF ORDNANCE. Caliber .45 line-throwing gun, description and instructions for use. (Ordnance Pamphlet 546 (First revision) Dec 1944. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes and gives detailed instructions for the use of the Caliber .45 Line-throwing Gun and related equipment. Photographs.

PB 15988. U. S. NAVY DEPARTMENT. BUREAU OF ORDNANCE. Gunnery safety precautions, their origin and necessity. (Ordnance Pamphlet 1014) Jul 1943. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
A lecture delivered by Rear Admiral W.H.P. Blandy to gunnery officers of the Pacific Fleet during the summer of 1929, giving background knowledge of gunnery safety precautions.

PB 16012. U. S. NAVY DEPARTMENT. BUREAU OF ORDNANCE. Inspection gage manual for inspectors of naval ordnance material. (Ordnance Pamphlet 1434) Feb. 1945. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
This pamphlet provides instructions, procedures, and general information pertaining to Navy Ordnance inspection gages used by Naval inspection personnel. Change 1, June 13, 1945, is included in this report which is illustrated with gage record forms.

PB 15985. U. S. NAVY DEPARTMENT. BUREAU OF ORDNANCE. Shotgun mount assembly, Mark 1, Mod 0. (Ordnance Pamphlet 1427) Feb 1945. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This pamphlet describes Shotgun Mount Assembly Mark 1 Mod 0 and contains instructions for its use. It is issued for the training of all personnel concerned with the use of the assembly. Photograph of assembly is given.

PB 5890. U. S. OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT. NATIONAL DEFENSE RESEARCH COMMITTEE. Flame throwers and incendiaries: Part I, Flame throwers and fuel: Part II, Incendiaries: PartIII, Aluminum soaps. Aug 1944. 22 p. Price: Microfilm - 50¢ - Photostat - $2.00
This is a monthly report from several firms on various subjects as follows: Arthur D. Little, Inc., "Studies of special flame thrower fuels", Standard Oil Development Co., "Development of flame throwers", Eastman Kodak Co., "Studies of thickened liquids", Morgan Construction Co., "Development of Ram Type flame thrower for M4A1 Tank"; Harshaw Chemical Co., "Study of aluminum soaps for thickening gasoline"; C.F. Braun & Co., "Development of mechanized flame throwers"; and Ferro Drier & Chemical Co., "Field mixing of flame thrower fuels; Factory Mutual Research Corp., "Development of incendiaries"; Standard Oil Development Co., "Development of oil incendiaries"; The Texas Company, "Development of incendiaries"; and Stanford University, "Fundamental studies of aluminum soaps".

PB 15364. WEAVER, F. R. Report of Comparative Tests of Airplane Chemical Spray Tank M6R9 and Air Corps A-17 Chemical Tank with Airplane Y1A-18, April 7, 1938. (CWS Tech Div Memo Rept 127). Apr 1938. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
The purpose of the investigation was to test each type of chemical spray tank on Y1A-18 airplane to determine:
a- Mechanical performance.
b- Atomization characteristics.
c- Manner of filling, hoisting, and attaching tank to the airplane.
d- Probability of contamination.
Results of the tests, and photographs of the tank installations are presented.

PB 16159. WILLKE, L. G. Experimental delay elements for small thermit-magnesium explosive incendiary bombs. (CWS Tech Div Memo Rept 1156.) Dec 1945. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
The object of the work described in this report was to investigate and evaluate various types of variable time delay elements for initiating the explosion of anti-personnel H. E. charges in 2-lb. and 4-lb. thermit-magnesium incendiary bombs. Four bombs were designed with different types of delay elements and then tested. The bomb having a pyrotechnic delay element showed the most promise and it was recommended that further work be done on this type of delay element. Tables and drawings included.

PB 16183. WILLKE, LOUIS G. and BACKSTROM, HAROLD O. Explosive incendiary bomb, M5IR1. (CWS Tech Div Memo Rept 1074.) Jul 1945. 28 p. Price: Microfilm-50¢ Photostat-$2.00
The object of the work described in this report was to develop an explosive M74 type incendiary bomb, using Ensign-Bickford Crescent Brand fuse for the variable time delay element. It was concluded that such a bomb had been designed which would produce satisfactory functioning within the limitations set by the properties of the fuse. It was found that regardless of the design of the bomb, this fuse would deteriorate when subjected to temperatures of 150°F and above and that unless the bomb was carefully waterproofed, this fuse would deteriorate from the action of atmospheric moisture. It was recommended that no further work be done on this bomb. Drawings of parts of the incendiary bombs are appended.

PB 17234. WILLKE, L. G. Method of evaluating fragmentation of explosive incendiary bombs using telephone books. (Chem Warfare Serv Tech Div Memo Rept T2R8 [illegible] 1945. 37 p. Price: Microfilm-50¢ - Photostat-$1.00
The fragmentation of five explosive incendiary bombs, the AN-M54X-A1, an M50X designed by the National Fireworks Company, British MK I, AN-M52X type B, and AN-52X type I, was evaluated by exploding the bombs into a semi-circular wall of telephone directories. This wall consisted of [illegible] Baltimore telephone books arranged in 18 columns, 9 rows high, and 3 deep, supported in six specially constructed metal racks. The data were tabulated to indicate the distribution and penetration of fragments by rows and columns and are presented in tables and graphs. It is concluded that the relative anti-personal efficiency of the various types of explosive incendiary bombs can be determined from the results of the telephone book fragmentation set-up.

PB 16125. WILLYS-OVERLAND MOTORS, INC., TOLEDO, OHIO. Brochure: 155 m.m. - shell projectiles manufacturing. Jul 1944. 59 p. Price: Microfilm - $1.00 - Photostat - $4.00
This brochure has been prepared as a record of the production of the U.S. Ordnance 155 m.m. medium artillery projectile used extensively in the major theatres of World War II. It is the story of the contribution of the Willys-Overland Motors, Inc. in the application of mass production methods on the output of this type munition in greater quantities than ever before produced. As an introduction to this compilation there is included: "Millions of 155 m.m. shells by Willys-Overland", a comprehensive article on this company's shell operations with twenty eight illustrations. Sections 2,3,4, and 5 contain specification of materials, 4 floor plan layouts, charts and production and inspection practices.

PB 17091. WOODBERRY, D. L. Chemical filling for artillery shell. Static tests of 105-mm. (HOW.) chemical shell T4E1, filled with WP, FS, HS and simulated HS, Jan 21, 25, 27 and 28, 1940. (Chem Warfare Serv Tech Div Memo Rept 238) Aug 1940. 36 p. Price: Microfilm-50¢ - Photostat-$3.00
The object was to determine (a) which size tetryl burster, the 85 gram or the 117 gram, produces the better distribution of HS (mustard) and the better FS (sulfur trioxide) and WP (white phosphorus) smoke clouds by fragmentation of projectile shell, (b) the serviceable life of this ammunition. Graphs, photographs and tables are given.

PB 17099. WOODBERRY, D. L. Chemical filling for artillery shell: Static tests of 155 - mm. (HOW.) chemical shell MK.II, filled with simulated HS and WP, and equipped with special bursters developed by the Ordnance Department. (Chem Warfare Serv Tech Div Memo Rept 178) Jul 1938. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
The bursters as used in the tests described are not satisfactory from the viewpoint of chemical distribution. Photographs and tables are given.

PB 15357. WOODBERRY, DAVID L. CN Pot, Preliminary investigation. (CWS Tech Div Memo Rept 124) Feb 1938. 14 p. Microfilm-50¢ - Photostat-$1.00
This report presents the preliminary investigations for the development of a CN chloroacetophenone Pot which will set up tear gas concentrations, for training of tactical units more effectively and less expensively than the CN irritant gas candle, M1 or the tear (CN) hand grenade, M7.

PB 15356. WOODBERRY, D. L. Report of Engineering Test of CN Pot. Feb. 24, 1938. (Chem Warfare Serv Tech Div Memo Rept 125) 1938. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
A report of tests to determine the effect of various sizes of vent holes on the functioning of the CN (chloroacetophenone) pot is presented.

PB 17108. WOODBERRY, D. L. Report of engineering test of 4.2-in. chemical mortar aiming light M9. (CWS Tech Div Memo Rept 13) Nov 1935. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
The night aiming lamp was assembled to a flashlight which was mounted on a surveyor's transit and taken to a dark room to determine (a) the spread of the beam of light and (b) if the light from the flashlight would be visible from the rear end of the light aiming cap. The light was found satisfactory for service test. Diagrams are given.

PB 17097. WOODBERRY, D. L. Report of engineering tests of Livens projector materials. (Chem Warfare Serv Tech Div Memo Rept 201) Nov 1939. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
The objects of the tests described were to determine the cause of premature burst of the Livens projector shell; find a method for eliminating such malfunctioning; develop a new propelling charge using the chemical mortar disc powder and a range indicator for same to replace the propelling charge M111 and its corresponding range indicator. Tables and diagrams are given.

PB 17104. WOODBERRY, D. L. Report of inspection of fuses, impact, M15E8, 4.2-in. chemical mortar. (CWS Tech Div Memo Rept 46) Feb 1936. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
Examination of 218 fuses being sent to Fort Benning, Ga., preparatory for shipment, showed that there should be a more rigid inspection during the manufacturing, assembling and loading processes. Minor dimension changes of the fuse are shown on attached drawings.

PB 17101. WOODBERRY, D. L. Report of static firings of twenty (20) 105-MM. chemical shell T4. (CWS Tech Div Memo Rept 67) May 1936. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
It is concluded that there is little difference between the results obtained with the 75 gram and 100 gram bursting charges for subject shell filled with WP and simulated MS. Tables, photographs and charts showing the position of shell burst and the pattern obtained are given.

PB 17110. WRIGHT, H. V. Report of engineering test of 4.2-inch chemical mortar surface setup assembly (improved) with standard M7. (CWS Tech Div Memo Rept 8) Nov 1935. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
It is concluded that subject assembly is satisfactory for firing M38R2 shell, FS filled to a weight of 25# lb. Substitution of the M7 standard for the M1 standard relieves the stresses shown to exist in the proof test of the surface setup assembly, M1A1. Tables are given.

PB 17102. WRIGHT, H. V. Tests of Wright Field chemical tanks for A-17 airplane, April 21 - May 8, 1936. (CWS Tech Div Memo Rept 63) May 1936. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
The object was to determine whether two sample chemical tanks and discharge mechanisms were satisfactory for adoption. Results of several tests, recommendations, diagram and photographs are given.

PB 15774. YORK, J. W. Chemical spray tank M15R1, bomb bay, for use with A-20C airplane. (CWS Tech Div Memo Rept 539) Jan 1943. 37 p. Price: Microfilm-50¢ - Photostat - $3.00
This report records the tests made to develop a spray tank and discharge line for HS (mustard gas). The report in itself is complete; however, work on this type tank was discontinued. Tables illustrate the tests, and photographs and drawings illustrate the equipment.

PB 14481. YORK, J. W. Development of chemical spray tanks M13 & M16R1(M53). (Chemical Warfare Service Tech Div Memo Rept 662). Jun 1943. 105 p. Price: Microfilm-$1.50 - Photostat-$7.00
The object of the project referred to in the present report was to develop an airplane spray tank for disseminating smoke and toxic chemical agents to be carried in the bomb-bay of airplanes equipped to carry 2,000-lb bombs. On the basis of tests conducted on the M16R1 and similar bomb-bay tanks it was concluded that such tanks are relatively simple and require a minimum of parts, the contamination of the airplane is negligible and the tank stands up under all velocities and accelerations. An insulating jacket protects the contents from freezing for at least 10 hours at -40° F. Hoisting and dropping of the tank are relatively simple operations. The tank can be carried in any other airplane capable of carrying 2,000-lb. bombs. The performance of the tank appeared quite satisfactory. The report contains numerous photos showing the construction and operation of the spray tank both by itself and in connection with various types of airplanes in the air, and also several tables statistically indicating performances under varying conditions.

## PACKING AND PACKAGING

PB 11869. BURNHAM, C. E. Proposed manometer packing box, July 23, 1945. (AAF EMO DIV ESE 4-90) 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Report of experiments carried on by the Packaging Test Facility to determine the suitability of the proposed manometer packing box. This box consisted of a wood mounting cradle suspended in a cleated plywood box by means of sixteen coil springs. Delivery inspection revealed that seven springs had failed ultimately, one spring was approaching ultimate failure and the eight remaining springs showed permanent deformation to some extent. Maceration of the plywood side panels by the cradle mounting lugs was observed at two points. It was concluded that this type of manometer packing box was unsatisfactory. The seven photographs mentioned in the appendix are not included.

PB 11856. FEIGHT, E. R. Packaging of magnesium aircraft wheels. (AAF ATSC Memo Rept ESE 4-110) Aug 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This report presents a comparison of the method of packing magnesium aircraft wheels used by the Hayes Industries Inc. and a proposed Method II. Each wheel from Hayes Industries Inc. was wrapped in bleached kraft paper, protected on the sides by four corrugated pads and boxed in a 200# test, domestic corrugated board container. The wheel had received a coating of aluminum paint and the bearing had been coated with a heavy corrosion preventive. Method II pack consists of the original carton, xinylite barrier, and another domestic corrugated board carton. Both packs were placed in the tropical room for 15 days. The aluminum coating on the wheels was not sufficient to protect them from corrosion and the contractor's pack failed to give sufficient protection for overseas shipment. Method II pack is recommended for use. Photographs are missing.

PB 11858. HORTON, A. W. Method I-B packaging of engine bearings. (AAF ATSC Memo Rept ESE 4-106) Aug 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Tests were conducted to determine the adequacy of protection against corrosion of engine bearings packaged by Chevrolet. The bearings were protected by a heavy grease in a jean-cloth bag sealed with ethylcellulose. This pack was enclosed in an individual cardboard carton. After exposure in the tropical room for 30 days, the bearings showed no visual evidence of corrosion. Therefore, the submitted packages are considered satisfactory.

PB 15115. SHAW, FRED B., Jr. Packing incendiary bomb clusters - a container problem. n.d. 4 p. Price: Microfilm-50¢ - Photostat-$1.00

The packing problem and measures taken to overcome it are described in great detail. The packing of the cylindrically shaped scatter type clusters presented little difficulty, but the M-69, functioning primarily by throwing a mass of flaming gellied gasoline or modified asphalt onto the target, was especially liable to moisture damage since its non-moisture proof fuze contained a black powder element. Illustrations of containers, referred to in the report, are not attached.

PB 16949. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Letter report, wood container for cratering charges, German. (Rag 2916) Jul 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
A brief evaluation is given of a German wood container for cratering charges. Photograph is included.

PB 11148. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Carrier cargo M-29 (T-24) with 30 inch tracks, complete with tarpaulin. Export packing procedure. Single unit pack (S.U.P.). (O.P.O. Instructions 65 and amendment 1) Apr 1944. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
Instructions are given for disassembly, corrosion preventive procedure and prepacking prior to crating. Five pictures illustrate the procedure to follow in placing the prepacked boxes and the vehicle in the crate. For construction of the container there is a complete bill of material, a nailing schedule, and ten assembly drawings.

PB 17141. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Instructions for cleaning, preservation and packaging of ordnance fire control spare parts (Methods I and Ia), and amendment, dated 21 Dec. 1944. (Packaging Instruction AFPS-3). 1944. 33 p. Price: Microfilm-50¢ - Photostat-$3.00
Instruction and packaging procedure for shipment of subject equipment, prepared by Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Drawings.

PB 17003. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Ordnance packaging instructions for unit generating M7. (SNL group P-226). (AFPS-45) May 1943. 25 p. Price: Microfilm-50¢ - Photostat-$2.00
The instructions and packaging procedure for unit generating M7 outlined in this report were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. A detailed list of extra parts is included.

PB 17200. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for alkaline battery and potash refill solution. (Packaging Instruction AFPS-101) 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
The instruction for packaging this solution was prepared under direction of the Chief of Ordnance by the Fire Control Sub-Office, Frankford Arsenal. Photographs.

PB 17021. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for azimuth instrument M1910A1. (SNL group P 84). (AFPS 69) Feb 1944. 11 p. Price: Microfilm-50¢ - Photostat-$2.00
Instructions and packaging procedure for Azimuth Instrument M1910A1, a delicate fire control instrument, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Diagrams, photographs.

PB 17193. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for board, adjustment, fire, M1. (Packaging Instruction AFPS-108-1). 1945. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This instruction relative to packing a fire control instrument to prevent damage during shipment and storage was prepared under the direction of the Chief of Ordnance by the Fire Control Sub-Office, Frankford Arsenal. Photographs and diagrams.

PB 17016. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for clinometer, machine gun, M1917 W/E. (SNL group P-015). (AFPS-74 Rev 1) Feb 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for clinometer, machine gun, M1917 W/E, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photograph.

PB 17018. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for clock message center M1. (SNL group P-194) (AFPS-72) Feb 1944. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
The instructions and packaging procedure for clock message center M1 presented herein were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs are included.

PB 17143. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for compass M2 W/E or compass prismatic M1918 W/E. (Packaging Instruction AFPS-2) 194. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Instruction and packaging procedure for shipment of subject instrument, prepared by Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal.

PB 17195. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for corrector percentage M1. (Packaging Instruction AFPS-106) 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This instruction for packing the instrument were prepared under the direction of the Chief of Ordnance by the Fire Control Sub-Office, Frankford Arsenal. Photographs.

PB 17158. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instructions for directors M5 and M6 extra parts and sub-assemblies. (Packaging Instruction AFPS-17) Jan 1943. 14 p. Price: Microfilm - 50¢ - Photostat - $1.00
Instruction and packaging procedure for shipment of subject equipment, prepared by Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal.

PB 17002. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instructions for domestic and interplant shipment of optical elements. (AFPS-46) Feb 1944. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Two alternate procedures for packaging optical elements for domestic interplant shipment, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal, are presented in this report. Drawings are included.

PB 17194. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for finder, range, M7, M9, or M9A1, W/infantry equipment. (Packaging Instruction AFPS-107-1) 1945. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
This instruction for packing the range finder to prevent damage during shipment and storage was prepared under the direction of the Chief of Ordnance by the Fire Control Sub-Office, Frankford Arsenal. Photograph.

PB 17006. U.S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instructions for instrument, observation, A.A., B.C., M1 W/E. (AFPS-43-1) Aug 1945. 20 p. Price: M-50¢ - Photostat-$2.00
Instructions and packaging procedure for instrument, observation, A.A., B.C., M1 W/E presented in this report were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs.

PB 17031. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for mount, telescope M6A1. (SNL group P-156). (AFPS-61) Feb 1944. 25 p. Price: Microfilm-50¢ - Photostat-$2.00

Instructions and packaging procedure for the Telescope mount M8A1, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Diagrams, photographs.

PB 17144. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instructions for mount telescope, M16, with panoramic telescope, M1. (Packaging Instruction AFPS-1) 1945. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
Instruction and packaging procedure for shipment of subject equipment, prepared by Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs.

PB 17145. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for mount, telescope, M18A1, for telescope, panoramic, M12 series, W/E. (Packaging Instruction AFPS-29). 1945. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Instruction and packaging procedure for shipment of subject equipment, prepared by Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs and diagram.

PB 17008. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for mount telescope M25 for telescope panoramic M12 W/E. (SNL group P-216) (AFPS-37 Rev 1) Feb 1945. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
The instructions and packaging procedure for telescope mount M25 for panoramic telescope M12 W/E presented in this report were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs are included.

PB 17139. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT Packaging instruction for mount telescope M28 W/E. (Packaging Instruction AFPS-5-1) 1945. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Instruction and packaging procedure for shipment of subject equipment, prepared by Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs and diagram.

PB 17138. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for mount, telescope M29. (Packaging Instruction AFPS -6-1) 1944. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Instruction and packaging procedure for shipment of subject equipment, prepared by Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs and diagram.

PB 16994. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for mount telescope M30. (SNL group P-223). (AFPS-60) Feb 1944. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
These instructions and packaging procedure for the telescope mount M30 were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs and drawings are included.

PB 17012. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for mount, telescope M39 (SNL group P-2). (AFPS-33) May 1944. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for Mount, Telescope M39, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs.

PB 16996. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for mount telescope, M44. (SNL group P-271). (AFPS-58) Feb 1944. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
These instructions and packaging procedure for the telescope mount M44 were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Diagrams and photographs are included.

PB 16999. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for oil gear M3. (SNL group P-208). (AFPS-51) May 1944. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
These instructions and packaging procedure for Oil Gear M3 were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Diagrams and photographs are included.

PB 17196. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for optical elements for finder, height M1. (Packaging Instruction AFPS-106) 1944. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
This instruction was prepared for items which require special packaging to prevent damage during shipment and storage. It was prepared under the direction of the Chief of Ordnance by the Fire Control Sub-Office, Frankford Arsenal.

PB 17204. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for periscope M8 and M9. (Packaging Instruction AFPS-98) 1944. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
The instruction for packing these periscopes to prevent damage during shipment and storage was prepared under the direction of the Chief of Ordnance by the Fire Control Sub-Office, Frankford Arsenal. Photographs and diagrams.

PB 17198. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for periscopes T13 & T14. (Packaging Instruction AFPS-103). 1944. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
This instruction for packing periscopes to prevent damage during shipment and storage was prepared under direction of the Chief of Ordnance by the Fire Control Sub-Office, Frankford Arsenal. Photographs.

PB 17019. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instructions for quadrant, elevation, M9 (SNL group P-281). (AFPS-71) Feb 1944. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for Quadrant, Elevation, M9, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Diagram, photographs.

PB 16998. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for quadrant, range, M10C W/E. (SNL group P-297). (AFPS-52-1) Mar 1945. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
These instructions and packaging procedure for the Quadrant, Range M10C W/E, were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs are included.

PB 17201. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for quadrant adapter M8. (Packaging Instruction AFPS-100) 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
The instruction for packing this quadrant adapter to prevent damage during shipment and storage was prepared under direction of the Chief of Ordnance by Fire Control Sub-Office, Frankford Arsenal.

PB 17020. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for sight, computing, M7. (SNL group P-276. (AFPS-70) Feb 1944. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
Instructions and packaging procedure for sight, computing, M7, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs, diagrams.

PB 17203. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for sight, M6, W/E. (Packaging Instruction AFPS-97-1) 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00

This instruction for packing the sight to prevent damage during shipment and storage was prepared under the direction of the Chief of Ordnance by the Fire Control Sub-Office, Frankford Arsenal. Photograph.

PB 17010. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for system, sighting, M5. (SNL group 241) (AFPS-38) Mar 1943. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
The instructions and packaging procedure for system, sighting, M5 presented herein were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal.

PB 17202. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for system, sighting M7. (Packaging Instruction AFPS-99) 1944. 18 p. Price: Microfilm-50¢- Photostat-$2.00
This instruction for packing the components of the sighting system was prepared under the direction of the Chief of Ordnance, by the Fire Control Sub-Office, Frankford Arsenal. Photographs and diagrams.

PB 17022. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescope, B. C. M65. (SNL group P-259). (AFPS-68) Feb 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for Telescope B. C., M65, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs.

PB 17140. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT Packaging instruction for telescope, elbow, M1A1. (Packaging Instruction AFPS-4-1) 1945. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Instruction and packaging procedure for shipment of subject equipment, prepared by Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs.

PB 17023. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescope, elbow, M17. (SNL group P-231). (AFPS-67) Feb 1944. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for Telescope, Elbow, M17, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs, diagrams.

PB 17017. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescope M19, M38, M40. (AFPS 73) Feb 1944. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for telescope M19, M38, M40, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photograph.

PB 17015. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescope, M60. (SNL group P-252). (AFPS-30) Feb 1944. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for telescope M60, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photograpes, diagrams.

PB 17004. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescope, elbow, M62. (SNL group P-262). (AFPS-44-1-) Aug 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedures for telescope, elbow, M62 outlined in this report were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photograph is included.

PB 17197. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescope M70 series. (Packaging Instruction AFPS-104) 1944. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This instruction for the packing of the M70 telescope series was prepared under the direction of the Chief of Ordnance by the Fire Control Sub-Office, Frankford Arsenal. Photographs and diagrams.

PB 17024. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescope, M6, M7, M33, M74. (AFPS-66) Feb 1944. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for the Telescope, M6, M7, M33, M74, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs.

PB 17001. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescopes M71C, M71D, M71G, M72 and M72D. (SNL group P-235). (AFPS-47 Rev 1) Feb 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for these telescopes were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs and diagrams are given.

PB 12027. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescope, observation, M4, M48, and M49. (AFPS 64) Feb 1944. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for the Telescope, Observation, M4, M48, M49, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photograph.

PB 17000. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescope, panoramic, M8. (SNL group P-196). (AFPS-48-1) Aug 1945. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
These instructions and packaging procedure for telescope, panoramic, M8, were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs and diagrams are included.

PB 16997. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for telescope, T108 -- T116. (SNL group P-2). (AFPS-57). Feb 1944. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for the telescope T108-T116 with adapter were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs and diagrams are included.

PB 17007. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for unit, generating M5. (SNL group P-227). (AFPS-40) Apr 1943. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
The instructions and packaging procedure for unit, generating M5 presented herein were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photographs are included.

PB 17199. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for voltage regulator M-1. (Packaging Instruction AFPS-102) 1944. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
This instruction was prepared for packing the voltage regulator to prevent damage during shipment and storage under the direction of the Chief of Ordnance by the Fire Control Sub-Office, Frankford Arsenal. Photographs and diagrams.

PB 17005. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for watch and clock extra parts cabinets W/E. (AFPS-43-1) Mar 1945. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
Instructions and packaging procedure for watch and clock extra parts cabinets W/E outlined in this report were prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Extra parts are listed and cabinet and containers for parts are described. Photographs are included.

PB 17030. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Packaging instruction for watches, pocket. (AFPS-62 Rev 1) Jan 1945. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions and packaging procedure for pocket watches, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal. Photograph.

PB 11145. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. 700 gallon water tank on 2½ ton - 6x6 G.M.C. truck. Single unit pack - S.U.P. Export packing procedures. (O.P.C. Instructions 62) Aug 1943. 32 p. Price: Microfilm-50¢ - Photostat-$3.00
Instructions are given for disassembly of the vehicle, corrosion preventive procedure, and prepacking prior to crating. One picture shows the vehicle disassembled with all parts identified and listed. Eight pictures illustrate the procedure to follow in placing the various parts in the crate. For construction of the container there is a complete bill of material, a nailing schedule, and eleven assembly drawings.

PB 17028. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Specifications. (AFPS-63) n.d. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
General instructions and specifications for spare parts unit prepackaging for Mount Telescopes M52C, prepared by the Ordnance Department, Packaging Unit, Fire Control Sub-Office, Frankford Arsenal.

PB 11095. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. Trailer cargo. 1 ton, 3-wheel with steel body. Export packing procedure. Two unit pack - T.U.P. (bundle). (O.T.C. Instructions 170 Supp 1, and Amendment 1) Dec 1944. 60 p. Price: Microfilm-$1.00 - Photostat-$4.00
A photograph accompanies instructions given for the disassembly of one trailer with steel body. Treatment, prepacking and disposition of removed items are described in detail. Procedure to follow in crating the parts is illustrated by 13 photographs. There is a detailed bill of material and nailing schedule; and the construction of the container for two trailers is shown in 16 assembly drawings. Ordnance packing instructions, O. P. C. 1.170, was designed specifically for packing steel body trailers and O.P.C. 1.169, was designed specifically for wood body trailers. Supplement 1 to O.P.C. 1.170 is provided for the use of contractors who have occasion to pack wood or steel body trailers concurrently and desire to use a standardized container. The supplement contains a bill of material and 16 assembly drawings for the universal crate.

PB 11166. U. S. WAR DEPARTMENT. ORDNANCE DEPARTMENT. 2½ ton 6 x 6 truck, mobile shop body ST - 6, for G.M.C. or Studebaker chassis with cab, for S.N.L. Nos. G-508 and G-630. Export packing procedure. Single unit pack (S.U.P.) (OPC Instructions 89) Aug 1944. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
The body arrives in a complete built-up condition where all interior equipment and tools are installed and packaged. The body is then completely crated for transit as outlined in these instructions. This packing procedure covers only the crating of the body already equipped. Procedures to follow in crating the body are shown in 5 photographs. There is a detailed list of bill of material, and miscellaneous packing material (not found on bill of material) is specified. General nailing instructions are shown in seven illustrations. Construction of container is subdivided as follows: Lumber, weatherproofing, nailing schedule, drainage, board measure, corner irons; and 5 working drawings show the procedure.

PB 17093. WOODBERRY, D. L. 4.2-in. chemical mortar shell (2), transportation test of the assembling and packing of the 4.2-in. chemical mortar shell E38R2, April 17 to June 6, 1940. (CWS Tech Div Memo Rept 232) Jun 1940 10 p. Price: Microfilm-50¢ - Photostat-$1.00
Design of the box was found satisfactory but it is believed that the use of fiber containers would be a cheaper and better means of packing the shell. Detailed diagrams are given.

## PERSONNEL APTITUDE TESTING AND JOB TRAINING

PB 15514. GRETHER, W. F. The School of Aviation Medicine steadiness test, form B. (AAF School of Aviation Medicine, Randolph Field, Texas. Project 95, Rept 1) Dec 1942. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
Form B of the S.A.M. steadiness test is a later and improved version of form A of this same test, described in an earlier report (School of Aviation Medicine Research Report No.77). For the sake of economy in design and construction, this later form has been built as an adaptation of the steadiness aiming test, form B, which is also described in another report (School of Aviation Medicine Research Report No. 88). The basic feature of this test is a silver rod or stylus which extends through a target aperture, a hole in a silver plate. The candidate's task is to hold the stylus by an insulated handle, and attempt to keep it in the center of the target and away from the edge. Contact of the stylus with the edge of the target closes a circuit to an electrical counter. Thus, the greater the unsteadiness of the candidate's arm and hand, the greater will be the number of contacts with the edge of the target and the higher his total score. This test is designed for use in classification of pilots, bombardiers and navigators. Photographs and diagram showing dimensions of test unit are included.

PB 12159. MASON, HARRY M. and others. Indoctrination for voice communication at altitude. (Applied Phychology Panel, NDRC Project SC-67, Report 14. (OSRD Rept 5307). 1940. 39 p. Price: Microfilm-50¢ - Photostat-$3.00
Experiments were conducted in altitude chambers at AAF School of Aviation Medicine, Randolph Field, Texas, to determine suitable methods for indoctrinating aircrewmen in voice communication at altitude. Experiments and observations indicate that a brief program of indoctrination stressing loud, slow, clear speech, if given at altitude pressure in aircraft-type noise, produces improvement in intelligibility. Attempts to ascertain the feasibility of communication indoctrination under altitude pressure conditions in cold temperature were handicapped by equipment failure. Special maintenance procedures were worked out to prevent such failures. A course for indoctrination in voice communication problems at altitude is presented. Voice communication equipment for altitude chambers is described, and instructions are given for its installation and special maintenance. Photographs, graphs, wiring diagram and tables of results are included.

PB 12156. MASON, HARRY M. and others. Training studies in voice communication: Panel, NDRC Project SC-67, Report 18. (OSRD Rept 5461). 1945. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
Presentation of four experiments performed at Voice Communication Laboratory, Waco AAF and at Goodfellow AAF in conjunction with the ground school course in voice communication, designed to investigate effects of training in pronunciation or articulation. Results indicate that training to pronounce accurately and clearly produces increased intelli-

gibility. Instruction to stress final consonants resulted in increased intelligibility when the T-17 (hand held) microphone was used, but not when T-30 (throat) or AMB-M-C1 (mask) microphone were used. No gains in intelligibility were shown as a result of instruction to stress sibilant sounds. Training for one hour in clear pronunciation affected a subsequent intelligibility test, not only in the scores obtained by the speakers, but in the degree to which words were articulated, as determined by judges who heard phonograph recordings of tests given before and after training. Loudness of speech signal was not changed by this training. Results of tests are tabulated.

PB 15807. NATIONAL DEFENSE RESEARCH COMMITTEE, APPLIED PSYCHOLOGY PANEL. Selection and training of radio code operators: Memorandum No. 5; graduation and rating test for class A radio schools. (APP532) Aug 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
Results of study of special testing in 8 schools with the BuPers mixed Code Tests at 14 and 18 GPM are presented and discussed. The main purpose of this study, under Project N-107 with the Psychological Corporation, was the practical and exploratory one of determining suitable speeds on which to base a plan of uniform and reliable final testing for class A schools. An important by-product arises from these data as this is probably the first time that class A radio schools have been compared on the same reliable and standard test. Thus it is possible to observe whether these schools, operating for the same purpose and on the same directive with respect to standards, actually are alike or are divergent in the code-copying ability of their students at the end of sixteen weeks of training.

PB 12025. THE PSYCHOLOGICAL CORPORATION. A study in training classification petty officers to select telephone talkers. (Speech Communication Project Rept 3. OSRD Rept 1931) Nov 1943. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
A speech communication research unit temporarily established at Bainbridge Naval Training Station operated from June 21 through July 9, 1943, coinciding with a term of instruction for classification interviewers. The purpose of this investigation was to study the feasibility of routine training of classification interviewers to administer the Speech Interview for telephone talkers and so make the system generally useful throughout several training centers. Tables I and II summarize the class judgments in evaluating 12 recorded speech interviews.

PB 16781. REHMANN, ALFONS. The role of training in the increase of the effect of weapons. Outline of a science of military training. n.d. 40 p. Price: Microfilm-50¢ - Photostat-$3.00
This report comes from the Medical Division of the Research Institute Graf Zeppelin, formerly Medical Division of the Experiment Station of the Luftwaffe Rechlin. The rather long, theoretical discussion of training leads eventually to principles which are to be considered in achieving desirable results in training soldiers in the use of weapons. Apparently it was written in English by the German author since no translator is given. At times the English is halting. The author defines training as the development of physical, intellectual and spiritual abilities for the purpose of developing a talent, improving a skill or perfecting an ability, but the chief emphasis of the article is on the development of physical skills. The author says there are two aims for military instruction: "firstly, to increase the effectiveness of existing weapons by an optimal procedure to training; secondly, to facilitate the use of new weapons which make special demands on human abilities and consequently require a high degree of training." The statement is made several times that the questions were solved experimentally but no actual statistics of experiments will be found in this paper. However, the major portion of the document is devoted to the three conditions which were found to be most influential in determining the success of training, i. e., the will to train, the duration of training, and the technique of training, and the attention given to these three elements in the experiments which were conducted. In conclusion there is a seven-page summary which covers the following subjects: Influence of the training leader on effect of training; abbreviated procedure; limitation in application of the laws of training; the effect of weapons and degrees of training; advantages of instruction as a means for the increase of the effect of weapons; practical suggestions. This report will not reproduce well.

PB 14323. SHANCK, R. B. Tests to compare ability of N.D.R.C. and military operators in reception of telegraph signals through interference. (OSRD Division of Radio Coordination Report 966-33). 1944. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
The data given in this report represent the first known sampling of service operating personnel. Assuming equal skill on the part of enemy operators, the data are indicative of the ability of average enemy operators; also the N.D.R.C. operators are probably representative of the most skillful ones who will occasionally be available for reception during adverse conditions. Accordingly, the data should be of much value in connection with jamming studies. Diagrams and graphs.

PB 12143. SMITH, K. R. and VOSS, H. A. Item differentiation and derivation of a 50-item scoring key for the Officer Personal Inventory, Form 1. (NDRC. Applied Psychology Panel, Project N-117. Memo 4) Feb 1945. 18 p. Price: Microfilm-50¢ - Photostat-$2.00
A 50-item scoring key was constructed for the Officer Personal Inventory, Form 1, consisting of the items found most effective in differentiating between 83 emotionally, disqualified officers and 1300 qualified officers in training in the Amphibious Training Command, U. S. Atlantic Fleet. Tables of data are included.

PB 12147. SNIDECOR, JOHN C. A preliminary study of the abilities of rated men to judge speaking performance. (OSRD Report 1823. Speech Communication Project Rept 2) Aug 1943. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
Three classification petty officers and one criterion judge evaluated through the speech interview the talking ability of 145 enlisted naval personnel. Coefficients of correlation between the judgments of each of the petty officers and the criterion judge show fairly satisfactory agreement during the judging period. The speech interview apparently can be administered by trained petty officers. Tables of data are presented.

PB 15814 U. S. NAVY. PACIFIC FLEET. SMALL CRAFT TRAINING CENTER, ROOSEVELT BASE, SAN PEDRO, CALIFORNIA. Instruction in operation of electric winch trainer (Preliminary edition). (Applied Psychology Panel, NDRC. Project N-116b. Report 503). 1944. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
This report contains four lectures on the basic facts important in winch instruction, and a rating from to grade trainees. Winch training procedures are outlined for the Small Craft Training Center, Roosevelt Base, San Pedro, California, with the cooperation of the University of Southern California, under OSRD Contract OEMsr-1372. Photographs and diagrams are included.

PB 16460. WEDELL, CARL H. A study of the prediction of night lookout performance. (OSRD Rept 3357. NDRC Applied Psychology Panel Rept 9b) Mar 1944. 42 p. Price: Microfilm-50¢ - Photostat-$3.00
This report is concerned with an experiment to determine the reliability of certain night vision tests which were part of regular Navy procedure. Tests were administered twice to a large group of men and then results of these tests were compared with scores indicating actual ability as night lookouts in situations which would as far as possible duplicate the conditions under which a test lookout would be forced to work. The following tests were conducted: Radium plaque adaptometer; clockface adaptometer; Purkinje test; K. U. Smith test of visual-motor coordination; Tufts-SDS test of night vision; Hecht-Schlaer adaptometer-RCH model; NDRC model III. Test data for all tests are shown in the report. Sco-

ter diagrams show the scores of the first administration of each test plotted against the second administration. Correlation coefficients and chi square data are given. Personality tests were given and verbal scores of the NGCT were obtained. Then the field tests were carried out. Finally relationships were worked out between the various scores. It was discovered that the four personality tests and the NGCT did not show any significant relationship to night lookout performance as measured by the criterion scores. It was decided that the following tests should not be used to determine ability as night lookouts: Smith visual-motor coordination test; the Hecht-Schlaer adaptometer; and the Purkinje test.

## PHOTOGRAPHIC AND OPTICAL GOODS (INCLUDING PHOTOGRAPHIC PROCESSING)

### German

PB 15795. I. G. FARBENINDUSTRIE, A. G. Gebrauchsanweisung für die Agfa-Abstimmfilterscheibe. (Directions for use for Agfa color correction filter). n. d. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
The report describes the composition of the filters and the use of the filter with Agfa negative-positive emulsions. In German. See PB 15476.

PB 23285. U. S. NAVAL TECHNICAL MISSION IN EUROPE. German interference filters. (With enclosure, German patent 716153, Interferenzlichtfilter, Jan 14 1942) (Letter rept 159-45A) Jun 1945. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This report contains a copy of a German Patent No. 716153 for interference filters, issued Jan 14, 1942 to Jenaer Glaswerk Schott and Gen., Jena. These filters are produced in three different strengths with maximum transmission of approximately 10, 20, and 30 per cent. They are classified in MU by the abbreviation HwBr. This designation is from the German word "Halbwertsbreite" which indicates the width of the band of half of its maximum transmission. Therefore the HwBr amounts to approximately 3.4 or 4.5 per cent respectively of the wave length at maximum transmission, divided by the interference order of the filter in question. This should be of interest to all agencies concerned with narrow band interference filters, particularly laboratories concerned with meteorological and astrophysical observations. Original inventor is Walter Geffcken.

PB 15944. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Instrument, tool microscope - German. (Rag 2934) Aug 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This instrument, used for the inspection of surface defects, finished work, etc. consists of a table, vertical column and microscope. The microscope is focused by rack and pinion and can be swung 5 degrees from the vertical. Photograph is included.

### United States

PB 16774. MacCASH D. Infrared reflectance standards for camouflage finishing materials. (AAF Eng Div ENG-56-M4211) Sep 1943. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
This memorandum report gives information on the use of the infrared camera as a means by which infrared reflectance could be measured. A small camera mounted on an Eastman precision enlarger stand, with two 3200 K lamps mounted so as to illuminate the specimens at an angle of approximately 45 degrees in order to avoid highlights. This was used to determine suitable limits of infrared reflectance for inclusion in aircraft finishing materials specifications. Photograph of the stand, and of a model airplane showing results and 6 spectrophotometer curves are appended. An appendix gives changes recommended in use of the test procedure.

PB 17547. SCAVUZZO, S. Light sensitive reproduction materials. (FIAT Final Report 528) 1946. 90 p. Price: Microfilm-$1.00 - Photostat-$6.00
The investigations covered by this report embrace the field of light sensitive reproduction materials used for the photo reproductions of drawings and documents of the engineering industry. In this group belong light sensitized materials using the diazo compounded dyes for direct positive reproductions by dry and moist development, negative sensitized materials composed of iron salts, and negative brown and sepia reproduction materials composed of silver bichromate and iron salts. The sensitizing formulas of a number of firms were obtained but the data obtained from Kalle & Co. are the most important and are discussed at length.

PB 16008. U. S. NAVAL GUN FACTORY. Methods of drying and changing optical instruments. (NAVORD O.D. 2847). 1944. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
This report is concerned with remedies for fogging of optical instruments. The three parts of the report cover the following subjects: (1) Charging with dry gas or nitrogen; (2) charging rangefinders with helium; and (3) charging and drying submarine periscopes. Diagrammatic sketches and photographs are included.

PB 1b943. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Monoculars, interchangeable, for comparators - German. (Register 2937) Aug 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Made by Ernst Leitz, the various eyepieces contain fixed and adjustable scales, crosshairs, outlines of screwthreads, concentric circles, protractors, etc. A photograph is attached.

PB 12009. UNIVERSITY OF PENNSYLVANIA. Fungus fouling of optical instruments: Sealing compounds. Interim Report. (Tropical Deterioration Administrative Committee' Report 88). May 1945. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Report of work in connection with contract OEMsr-205 at the University of Pennsylvania, in May 1945. Sealing compound G-6 (See PB 12007) continued to show promise as an effective material for use on optical instruments. The addition of paranitrophenol to the extent of 1.5% is sufficient to prevent fungus growth with this compound. Tests on the permeability to water vapor of this and other compounds are described. Reports of tests on binoculars sent to the Dewey and Almy Company in order that they might be sealed by some of the sealing materials used in protecting vacuum-packed food materials, are given; also reports on corrosion of metals by fungicidal chemicals, and a study of protective substances for photographic films.

PB 16450. UNIVERSITY OF PITTSBURGH, PITTSBURGH, PENNSYLVANIA. A method for the prevention of mold growth on optical instruments exposed to tropical conditions. (OSRD Rept 4371) 1944. 18 p. Price: Microfilm-50¢ - Photostat-$2.00
This report developed under contract with NDRC by the University of Pittsburgh describes a method for protecting binoculars and other optical instruments against tropical deterioration. Formulas are given for an anticorrosive lubricant, a dead-black lacquer, and an adhesive wax treated to prevent fungus growth under conditions of exposure producing heavy fungus growth on untreated instruments. These formulations contain two per cent of fenchyl thiocyanoacetate, which is shown not to cause dimming of optical glass surfaces or to accelerate corrosion. Photographs. See also PB 16448 and PB 16449.

PB 16448. UNIVERSITY OF PITTSBURGH, PITTSBURGH, PENNSYLVANIA. Tropical deterioration in optical instruments. (OSRD Report 5767) 1945. 34 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes studies of tropical deterioration in optical instruments which have been carried out at the University of Pittsburgh under contract with NDRC. A method for preventing fungus growth in optical instruments is described in OSRD report no.4371 (PB 16450). A method for

laboratory testing of fungicides, materials and optical instruments is described in OSRD report no. 5010 (PB 16449). Since mites are responsible for the introduction of fungi into instruments and equipment, it was first necessary to obtain cultures of mites and fungi from tropical areas. The report describes the investigation as it was carried out. It discusses: The collections of biological material; preparation of mite cultures in pure strain; preparation and maintenance of tropical culture chambers; evaluation of fungus and mite-resistance of materials and chemicals; evaluation of deterioration of instruments under simulated tropical conditions; identification of causative organisms; life history of the mites involved; determination of limit size of holes permitting passage of mites, investigation of chemical contrahents and atrahents.

PB 16449. UNIVERSITY OF PITTSBURGH, PITTSBURGH, PENNSYLVANIA. Tropical testing. (OSRD Rept 5010) 1945. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
Under contract OEMsr-971 with NDRC the University of Pittsburgh has studied methods for protecting optical instrumnets against tropical deterioration. A method for laboratory testing of fungicides, materials, and optical instruments is described in this report. The test is conducted in an environment of sphagnum moss and bread, inoculated with several species of fungi by mites. This test is more severe than exposure for an equal length of time at most tropical stations. The concentration of mites is probably considerably greater than that at most tropical stations. The distribution of fungi is not necessarily the same under representative tropical conditions. Nonetheless, the test can be carried out much more quickly than tests in the tropics, and probably gives good indications regarding the tests which should be conducted in the tropics. It will be very desirable to arrange enough tests at a variety of tropical exposure stations to establish the correlation between results obtained at the University of Pittsburgh and the results of tropical tests. The present report describes tests of reagents for restraining fungus and mites and tests of a wide variety of materials. An earlier OSRD report no. 4371 (PB 16450) describes a method for preventing fungus growth in optical instruments. Another OSRD report no. 5767 (PB 16448) describes an investigation of tropical deterioration in optical instruments.

PB 16418. UNIVERSITY OF PENNSYLVANIA. THE JOHNSON FOUNDATION. Report on cresatin as a treatment for fungus proofing optical instruments. (OSRD Rept 3803) Jun 1944. 27 p. Price: Microfilm-50¢ - Photostat-$2.00
Fungus fouling of the glass surfaces of optical instruments used in the tropics can be prevented or at least temporarily retarded by developing designs which seal the parts. Mold development during storage in warehouses and outpost supply rooms can be prevented by conditioning the air to prevent moisture condensation. To tropic proof the majority of instruments already in use it was necessary to develop a fungicide. Cresatin, metacresol acetate, was found highly effective on all type of optical instruments. This paper deals with the manner of its use in various optical instruments and its effectiveness. Details of the use of Cresatin in the following instruments are given: Binoculars --KE, M-3, M8; periscopic tank sight - M-4; telescope elbow -M-17; panoramic telescope -M12-A2; aiming circle -M-1; battery commanders telescope - 1916 and 1917 models. Experiments have shown that Cresatin at a concentration of 1 part in 100,000 parts of air (by volume) will give complete control of fungus and mite inspection. Since instruments are seldom completely sealed it is necessary to provide Cresatin in excess in order to accomodate a gradual loss. Photographs of instruments and parts are given.

PB 16463. UNIVERSITY OF PENNSYLVANIA. JOHNSON FOUNDATION. Report on methods of prevention of fungus fouling of optical instruments in the Canal Zone. (OSRD Report 3952) 1944. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This report prepared under contract with NDRC reviews the methods which are being investigated for the control of fungus fouling of optical instruments in the tropics. The report includes description and plan of a portable dry chest in which small quantities of instruments may be stored safely. There is a diagram of the chest.

PB 16451. UNIVERSITY OF PENNSYLVANIA. JOHNSON FOUNDATION. Report on the fungus fouling of optical instruments. (OSRD report 4118) 1944. 90 p. Price: Microfilm-$1.00 - Photostat-$6.00
Under Project CD-43 the NDRC has carried out studies of tropical deterioration in optical instruments and investigations of methods for preventing the deterioration of optical instruments in the tropics, due to fungus, mites, and moisture. The present report describes observations on optical instruments in Panama, laboratory studies of fungicides and laboratory and field tests of optical instruments treated with fungicides, a specific method of treatment is recommended. Results of various tests are presented in tabular form. Photographs of fungus filaments and spots are appended.

## RUBBER AND RUBBER PRODUCTS

### German

PB 13338. BOSS, A. E. Accelerators and age-resistors. (Office of Rubber Reserve Rept No. CC-37) Aug 1945. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
This report is a translation excerpt by A. E. Boss from an I. G. Farben sales bulletin entitled "Handbook for the Rubber Industry", giving a short description of the various products produced by I. G. for the rubber industry. The particular section herein translated deals with the identification of various I. G. accelerators and age-resistors.

PB 18292. DANIEL, ER. Über die struktur des oppanes butadien - emulsionskautschuks. (The structure of the oppanol butadiene-emulsion rubber). 27 p. Price: Microfilm-50¢ - Photostat-$2.00
The butadiene polymer contained in the emulsion polymerized rubber owes its favorable stress and tensil strengths to the presence of 20 - 30% by weight of oleic acid in the raw polymer. Many other additives give similar results. The colloidal structure of the butadiene-emulsion polymerized rubber is comparable to that of natural rubber. The appendix contains many graphs. In German.

PB 18300. DEUTSCHER VERBAND FÜR DIE MATERIAL PRUFUNGEN DER TECHNIK. Prüfung von gummi. (Testing of rubber). 1936-1941. 20 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a report of rubber testing procedures for the following: Determination of tensil strength of solft rubber, tear resistance, artificial aging of soft rubber, various chemical tests, softness of finished products, abrasion and softness of soft rubber.

PB 18299. I. G. FARBENINDUSTRIE. Prüfung von kautschukproben. (Testing of rubber). Jan 1935. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
This report is a letter from I. G. confirming the receipt of the order of a fire-blade cutter for rubber test pieces with cutting patterns. Errors and their influence resulting from imperfectly cut testpieces are described and tabulations and graphs of the tests are furnished as an appendix.

PB 13355. KONRAD, E. Status of methods of application and use in the synthetic rubber field. (Office of Rubber Reserve Rept CR 791, CD 440). Aug 1945. 54 p. Price: Microfilm-$1.00 - Photostat-$4.00
These reports are transmitted by the Technical Industrial Intelligence Committee, Rubber Subcommittee. They are translations of addresses given by the technical director of the I. G. Farbenindustrie rubber laboratories at Leverkusen. The first address was delivered Sept 26, 1940, and deals with properties of various types of Buna dn their uses. The second address was delivered May 28, 1942, and reports further on applications of Buna, including comparison with practice in the United States. The third address was delivered Mar 1, 1944, and includes a treatise on new types of Buna. Charts and graphs illustrate the report. The translations of these documents were made by A. E. Boss, R.W. Kix Miller, and L. Scratchley.

PB 16714. LIVINGSTON, J. W. Report on the Leverkusen Works of I. G. Farben, Leverkusen. (CIOS Rept File XXXI-76, Item 22) Jun 1945. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
The Leverkusen plant is a small producer of Buna rubbers, having a capacity to make 600 tons per month of these materials. The plant produces Buna N or Perbunan (several types), Buna SS, Buna SSN, Buna SSGV, and Buna SV. Of chief interest is the large research laboratory, rubber testing laboratory, and the experimental tire plant. Information was obtained regarding physical properties of Buna SV, and the physical characteristics of a new synthetic rubber, Saurem Buna, which Leverkusen's chemists believe to be better than Buna S-3. Information was also obtained regarding the main lines along which Leverkusen is conducting research to improve the qualities of the Bunas.

PB 13360. MARON, S. H. and others. Properties and analysis of German D-52 latex. (Office of Rubber Reserve Rept CR-535, CR 904). n.d. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes the results of investigation of the properties and composition of a sample of German D-52 latex. D-52 and IGETEX are very similar in all respects except pH, total solids, and viscosity. The higher value of the latter may possibly be due to the higher solids content. Moreover, the properties of D-52 latex approximate more closely those of GR-S type III than those of of Type II despite the fact that the combined styrene content is essentially identical with that in Type II latices. Figure 1 shows a flow sheet of D-52 latex analysis; figure 2 gives the absorption curves for Nekal fractions in IGETEX and D-52 latices. This is Report 29 from the case school of Applied Science.

PB 13337. RUBBER BUREAU, WPB and OFFICE OF RUBBER RESERVE, RFC. General summary of production and use of reclaimed rubber in Germany. (Rubber Reserve Co Rept CC-43). August 1945. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
The Germans had not developed any new techniques nor found any outstanding plasticizers to be used in reclaiming of Buna S scrap as compared to natural rubber scrap. Nor was there evidence that much research work had been done on the problem. The conventional refiner generally used was the two roller, but a three roll Vogel vertical type refiner was considered superior. Enclosed is a diagram showing the surface ratios of this roller. As one of the items in the appendix, there are enclosed excerpts from the report "General survey of German rubber industry" which may be found in its entirety as an appendix to PB 13336.

PB 13339. RUBBER BUREAU, WPB and OFFICE OF RUBBER RESERVE, RFC. Summary report: German synthetic insulation for wire and cable. (Rubber Reserve Co Rept CC-42). August 1945. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
This report covers the use of synthetic rubbers for insulation. Mention is made of Buna S, Buna N and numbered Buna rubbers for specific purposes. Very little experimental work was done on butyl rubber and neoprene, but polyvinyl chloride and polystyrene were in use. Compounding materials are mentioned and there is some discussion of the placing of the insulation on the wire and cable.

PB 13336. RUBBER BUREAU, WPB and OFFICE OF RUBBER RESERVE, RFC. Summary report on the production and performance of German synthetic tires and other transportation items. (Rubber Reserve Co Rept CC-31). August 1945. 89 p. Price: Microfilm-$1.00 - Photostat-$6.00
This is a comprehensive survey of the rubber industry in Germany. The three transportation-item producers visited were: Continental Gummiwerke A.G. (Hanover), Harburger Gummiwaren Fabrik Phoenix A.G. (Harburg) and Deutsche Dunlop Gummi Compagnie A.G. (Hanau). German tire production is treated at length and all stages of tire manufacture are considered, including mixing procedures, stock preparations, tire building and tire curing. Tires for all types of vehicles are discussed. All parts of tires such as treads, walls and inner tubes are also discussed, American tests of these German tires being tabulated. American investigators believe that the German tires are no better and probably not as good as American tires with the same natural rubber content. Their Buna inner tubes were defective due to a lack of natural rubber and they evidently had little knowledge of our butyl and neoprene tube developments. Fabric used was rayon which they preferred to cotton. German Buna was hard to handle. Reclaiming of rubber was not advanced. Buna S was being replaced by Buna S-3. Buna SS, a high styrene polymer and Perbunan, a butadiene-acrylonitrite rubber, were important developments. Two compounding materials Koresin and Plasticator No. 32 may have important uses. Other information given include: descriptions of types of Buna with their average "Defo" plasticity values"; descriptions of the various latices: Igetexs, ss, N and NN. As an appendix is attached the report: "General survey of German rubber industry."

PB 13359. SINN. Heat sensitization of buna latices (Translation of a German report). (Office of Rubber Reserve Rept No CR-831 and CD 491) Sept 1945. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
This document by Dr. Sinn, Central Rubber Laboratory, Group 2, I. G. Leverkusen, is dated March 6, 1940, and is report no. 2 on this subject. Translation was made by Dr. S. H. Maron, Case School of Applied Science, Cleveland, Ohio. The German synthetic latices are specifically dealt with and should have bearing on the possible uses of GR-S latices. The studies were concerned with coagulation of the various forms of latex upon the action of weakly acting coagulants and heat. This is a technical report to the Office of Rubber Reserve by the Rubber Subcommittee, TIIC.

PB 7902. STRAIDMAN, S. J. Harburger gummiwaren-fabrik Phoenix at Hamburg/Harburg 1. (BIOS Final Rept 70) 1945. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This report deals mainly with the respirator and protective clothing side of the firm's activities. An unsuccessful search was made for mustard resistant coatings as alternatives to oppanol. It is a typical up-to-date firm originally making tires, mechanicals, fabrics, boots. Their method of obtaining reclaim from tires was by digesting at 180° C. for 6-8 hours, the cotton being removed by treatment with sulphuric acid. Details of mixes for facepieces are appended.

PB 13362. U. S. OFFICE OF RUBBER RESERVE, RECONSTRUCTION FINANCE CORPORATION. Styrene production at Hüls, Germany. (TIIC Rubber Subcommittee Rept EM-303). Sep 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
The Hüls Buna Works is the second largest Buna S plant in Germany. It has a capacity of 4,000 tons per month of Buna S-3 and an equivalent capacity for the intermediate products, including styrene. Hydrocarbon gases are cracked in an electric arc to acetylene and hyrdorgen which are used in the production of butadiene and styrene. The styrene is produced in the same way as at Schkopau and Ludwigshafen. Butadiene and styrene are used for Buna S-3 using the continuous polymerization process similar to the Schkopau and Ludwigshafen plants. A chart shows the distribution of personnel among the various departments of the plant for a normal production month, November 1944.

PB 13361. U. S. OFFICE OF RUBBER RESERVE, RECONSTRUCTION FINANCE CORPORATION. Styrene production at Schkopau, Germany. (TIIC Rubber Subcommittee Rept EM-304). Sep 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
The I.G. Farben Buna Works at Schkopau is the largest synthetic rubber plant in Germany, with a capacity of 6,000 tons per month Buna S-3. In this plant calcium carbide is used to produce acetylene which then is used in the production of butadiene and styrene. Buna S-3 is produced from butadiene, styrene, Nekal, synthetic fatty acid (produced from paraffin oxidation), and other purchased chemicals. The function of ethylbenzene is related.

PB 13364. U. S. OFFICE OF RUBBER RESERVE, RECONSTRUCTION FINANCE CORPORATION. Styrene production in Germany. (TIIC Rubber Subcommittee Rept EM-284). Aug 1945. 22 p. Price: Microfilm-50¢ - Photostat-$2.00

The four largest producers of Buna-S rubber in Germany are located at Ludwigshafen, Hüls, Schkopau, and Auschwitz (last not completed). All have more or less identical processes for the production of ethylbenzene and styrene. This report covers the production and purification of ethylene, ethylbenzene and styrene. The conversion of ethylbenzene to styrene is carried out catalytically in the presence of a zinc oxide base (65% ZnO, 3% $Al_2O_3$, 2% CaO, 2% $K_2SO_4$, 3% $K_2CrO_4$ and 2% KOH). Total yield is 90% or slightly better of theoretical. Charts and drawings are included of ethylbenzene and styrene production. Flow sheets are included showing both the distillation and production of styrene and ethylbenzene.

PB 13357. U.S. TECHNICAL INDUSTRIAL INTELLIGENCE COMMITTEE, RUBBER SUBCOMMITTEE. Buna S production at Hüls, Germany. (Office of Rubber Reserve Rept CR-811, CD-459). Sep 1945. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
This is the second largest Buna S plant in Germany, with a capacity of 4,000 tons Buna S-3 per month. The report compares operation at Hüls with plants at Schkopau and Ludwigshafen. Source of materials for butadiene is hydrocarbon gases from coal hydrogenation, gas from natural wells and some gas from coke ovens. Cracking of these gases produces acetylene and hydrogen. Hüls uses acetylene for production of butadiene (Ludwigshafen uses acetylene and formaldehyde). Some of the hydrogen from the cracking process is used to convert aldol to butol which is dehydrated to produce butadiene. Hydrogen is also used to convert acetylene to ethylene. Styrene is produced by the action of ethylene and benzene. In addition to 3,300 tons Buna S-3 the Hüls plant produces 1,600 tons glycols, 3,300 tons chlorine and 3,600 tons caustic soda per month, as from production during November 1944.

PB 13368. U. S. TECHNICAL INDUSTRIAL INTELLIGENCE COMMITTEE, RUBBER SUBCOMMITTEE. Buna's production at Schkopau, Germany. (Office of Rubber Reserve Rept CR-812 and CD-460) Sept 1945. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
This report gives in detail a description of the facilities, processes, and production at the I. G. Farben Buna Werke, Schkopau (near Merseberg), the largest synthetic rubber plant in Germany. Plant capacity is stated as 6000 tons per month of Buna S-3.

PB 13356. U.S. TECHNICAL INDUSTRIAL INTELLIGENCE COMMITTEE, RUBBER SUBCOMMITTEE. Synthetic rubber research and production at Leverkusen, Germany. (Office of Rubber Reserve Rept CR-810, CD-458). Sep 1945. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
The Leverkusen plant produces about 600 tons per month of various Bunas: Buna N or Perbunan, Buna SS, SKE, SSCF and SW. Chief interest in this report is centered on the testing and research laboratories. The plant has produced and tested many polymers and co-polymers of various substances. Tests were also made on regulators and emulsifiers in efforts to obtain better rubbers. Leverkusen is working on improvement of the Buna and other synthetic rubbers, some of which are very promising.

PB 16391. U. S. WAR PRODUCTION BOARD, RUBBER BUREAU. Summary report, German synthetic insulation for wire and cable. 1945. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
A mission of experienced technical representatives of the American, Canadian, and British rubber industries to investigate German plants making insulation for wire and cable, and to interrogate operating personnel. Extensive technical data were obtained on compounding, construction and processing of rubber insulated cables. Buna S and polyvinyl chloride plastics were most commonly used for low voltage flexible cables. For voltages above 3000, oil impregnated cable was the principal insulation. Polystyrene was favored for high frequency applications. There is a discussion of the types of Buna and other materials used and of German wire and cable practices, covering production methods for rubber insulations, plastic insulations, and wire enamel. A number of typical compound formulations for several classes of insulations are given. (Page 21 of the report is missing from this copy).

PB 13340. MEIDLEIN, R. R., JR. and KIMMILLER, R. W. Production, compounding, and evaluation of German Buna S type rubber. (Rubber Reserve Co Rept CD-363 CR-693). April 21, 1945. 76 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report summarizes the latest information available on technical details of the production and use of German synthetic rubber. It also includes a considerable amount of information regarding the relative quality and characteristics, both of the German synthetic types and of a few compounding materials. For the compounding and use, there are also included considerations on softening procedures and compounding techniques. Included are graphs and 27 tables.

PB 18396. ZORPFRITZ, H. P. and SAUER, W. Das temperaturverhalten von personenkraftwagenreifen in abhängigkeit von fahrgeschwindigkeit und innendruck (The heating of passenger automobile tires with relation to speed and tire pressure). (Deutsche Kraftfahrtforschung. Technisher forschungsbericht, Zwischenbericht Nr. 127/;944). (ALSOS Mission HTR 311). May 1944. 78 p. Price: Microfilm-$1.00 - Photostat-$6.00
The investigation of heating of tires by proof-stand methods was conducted on level endless belts and on revolving drums. Results of tests by both methods were compared. It was seen that the temperature depended upon the rate of speed and other considerations, such as external (environmental) temperature, length of run, load, composition of tire, etc. Two types of thermometers were used in the tests. Drawings and 59 pages graphs were included.

United States

PB 13803. BEARDEN, J. L. The tensile strength of GR-S (CWS Gen Rept 9). Feb 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
The tensile strength of GR-S (Buna rubber) is greatly dependent upon the surface condition of the test specimen. A surface that is free from defects will produce uniformly high tensiles, whereas a surface that is not free from defects will produce tensiles that are low and not uniform. It is suggested that mold lubricants not be used as they affect the surface GR-S should be cured in a highly polished mold, preferably chromium plated. As a substitute clean zinc sheeting could be used. Graphs and photographs of the stretched specimens are attached.

PB 16773. CHASMAN, BERNARD. Plastic backing materials for self-sealing fuel tanks. (AAF Eng Div ENG-56-M340). Oct 1943. 33 p. Price: Microfilm-50¢ - Photostat-$3.00
Investigation to determine various mechanical properties of plastic materials which have been used or considered for use as backing sheets for self-sealing fuel tanks, and to study the correlation of the mechanical properties of the plastic materials with firing tests on typical installations of the plastic panels. Tests for tensile, bend, shear, Izod notched and unnotched impact, and Brichsen cupping or ductility properties were run, and results of these tests together with firing test ratings are given in the appendix. There are also 11 photographs as well as graphs illustrating test results.

PB 9790. COURSEN, L. T. Performance of non-skid tires, General 12 ply turbine tread, 47", smooth contour. (AAF Expt Eng Sect EXP-M-56-3927, Add. III). Feb 1943. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Findings on the performance of the rayon turbine tread tires after tests on B-25 and B-26 airplanes show them to be unsatisfactory for aircraft use because of (1) poor non-skid properties, (2) sub-standard wearing qualities, and (3) adhesion of stones and mud to the tread. The results of load deflection tests are presented in curves.

PB 10101. COURSEN, L. T. Synthetic and reclaim aircraft tires and service test results. (Army Air Forces, Engineering Division. ENG-56-4135, Add. 1). 1943. 52 p. Price: Microfilm-$1.00 - Photostat-$4.00

The purpose of this memorandum report is to record the data collected on the service test of various synthetic tires tested on training airplanes from March 1942 to June, 1943. The data will be analyzed, and recommendations for future development will be made by a joint Army-Industry Committee. The data is tabulated in Appendix 2 and Appendix 1 is a summary.

PB 10114. JAYNES, C. E. and MAHONEY, P. J. The properties of neoprene synthetic rubbers. Sept 8, 1942. (Army Air Forces. Eng Div EXP-M56-4172, Add. III) 1942. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
This report gives detailed results of a series of tests on chloroprene type synthetic rubbers in order to determine their suitability for various Army Air Forces applications. The compounds included low swell neoprene, high swell neoprene, and freeze resistance neoprene stocks. Tests were run to determine resistance to high temperature aging, freeze resistance, and to the effects of gasoline and lubricating oil. It was concluded that the neoprene type synthetics are suitable for many Army Air Forces uses.

PB 16612. KELSO, C. D., JR. Inflation control of aircraft tires. (AAF. Materiel Command. Eng Div Memo Rept EM-56-M4541). 1943. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
Two methods of controlling aircraft tire inflation - deflection method and inflation pressure method are discussed. Accuracy of the deflection method using a marker and using the General Tire and Rubber Company's "Deflect-O-Gage were tested. The gage was considered to be much more accurate and its procurement was recommended. Three photographs show deflection test results.

PB 16624. MAHONEY, P. J. Test on hydraulic cups. (AAF Expt Eng Sect U-EXP-M-51-4804) 1941. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Tests to determine volume increase of neoprene hydraulic cups. Cups failed to increase to specification when immersed in oil, specification no. 3580, which is a mineral oil. They were then tried in no. 3586 oil, which is a vegetable oil. Tables I and II of the appendix give a comparative picture of volume increase using the two oils.

PB 16528. MAHONEY, P. J. Volume change of butadiene synthetics on fuel immersion. (Army Air Forces. Air Tech Service Command Expt Eng Sect EXP-M56-4172, Add II) Sep 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
The volume change on fuel immersion of three Chemigum compounds and three Hycar compounds was determined at daily intervals for seven days.

PB 16611. POLK, E. M. Army-Navy packing specification AN-EM-P-114. (AAF Expt Eng Sect EXP-M-51/M752, Add. 10). May 1942. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
Problems of aircraft hydraulic packings in relation to the new specification were clarified with manufacturers. Development of new and better sources of supply of accumulator diaphrage materials, and the changes necessary in the specification to speed up production were discussed.

PB 13341. TECHNICAL INDUSTRIAL INTELLIGENCE COMMITTEE, RUBBER SUBCOMMITTEE. Manufacture of Buna rubber. May 15, 1945. (Rubber Reserve Co Rept CD-389). 6 p. Price: Microfilm-50¢ - Photostat-$1.00
The report describes the manufacture of Buna S-3 at the I.G. plant at Ludwigshafer covers building layout, process for producing Buna S-3, recovery of unreacted monomers, coagulation, drying and finishing.

PB 13363. U. S. OFFICE OF RUBBER RESERVER. RECONSTRUCTION FINANCE CORPORATION. The development of the new styrene catalyst. (TIIC Rubber Subcommittee Rept RM-302). Sep 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation of a review prepared for the buna meeting of July 29-30, 1944. The report covers experiments undertaken during 1940 in the styrene laboratory "Lu" of the I.G. Farbeninduastrie, Ludwigshafen-on-the-Rhine. The experiments were concerned with the additions of varying amounts of $Al_2O_3$, CaO, NaOH, $K_2SO_4$, $K_2Cr_2O_7$ and MgO to a ZnO base. The new catalyst was able to improve yields from about 80-82% to about 90% of the theory. The document was signed by a Dr. Ohlinger. Appended to the report is a translation of an additional paper by Dr. Ohlinger "The state of manufacturing establishments in Lu" with a flow-sheet showing the utilization of the dehydrogenation gas.

PB 22263. U. S. RUBBER RESERVE COMPANY. Photographs, supplementary to PB 2921: Government tire test fleet. Final report of government tests "X", nos. 28 and 207, ordinary cotton, "Wilds" variety cotton, and rayon cords in tire carcasses. 1945. 44 p. Price: Microfilm-50¢ - Photostat-$3.00
These photographs showing results of tire and tube tests are supplementary to PB 2921 which appears on page 227 of this Bibliography.

PB 16106. U. S. WAR DEPARTMENT. ORDNANCE TIRE TEST FLEET, NORMOYLE ORDNANCE DEPOT, San Antonio, Texas. Test M-285: 90% synthetic experimental cotton fabrics; 7.50-20-M & S; final report. Dec 1943. 36 p. Price: Microfilm-50¢ - Photostat-$3.00
The purpose of the test was to compare general service durability and treadwear of 90 percent synthetic experimental cotton fabric tires over hard roads, gravel roads, and over cross country. All three of the 90% synthetic 4/3 .026 gage experimental cotton fabric groups gave higher average mileage and better bruise break resistance than the Armstrong 90 percent synthetic regular cotton tires. The "Wilds' fabric 1 5/16" staple length group gave the best performance with the "SXP" group second and "Stoneville" third. Status of the indivinual tires, treadwear chart, atmospheric chart, and photographs are included.

PB 16108. U. S. WAR DEPARTMENT. ORDNANCE TIRE TEST FLEET. NORMOYLE ORDNANCE DEPOT, San Antonio, Texas. Test M-395: 90 percent synthetic 8 and 2 cap ply experimental cotton fabrics; 7.50-20 - M and S: Final report. Aug 1944. 26 p. Price: Microfilm-50¢ - Photostat-$2.00
The purpose of this test was to compare general service durability and treadwear of 90 percent synthetic 8 and 2 cap ply experimental cotton fabric tires over hard surface roads, gravel roads and over cross country. This test on experimental cotton fabrics indicates that the Stoneville and Wilds 42A cotton fabrics have better bruise break resistance than the Armstrong Regular Production Cotton Cord in the 90 percent synthetic 8 ply plus 2 cap ply construction. Status of the individual tires, treadwear chart, atmospheric chart, and photographs are included. Test was conducted during period May 29 - Jul 26, 1944.

PB 18410. U. S. WAR DEPARTMENT. QUARTERMASTER BOARD. Final report of test of Buna-S rubber taps and heels. (Project T-107). Jun 19, 1943. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
On the basis of a limited sample, this report concluded that the wearing qualities of Buna S taps and heels are in all cases superior to the standard reclaim rubber taps and heels; difficulty encountered with the copper washers and in driving nails into the designated mould required more time for attaching the type of Buna S heel used in this test than the standard reclaim rubber heel; clogging of the large holes in the Buna S heels was a contributing factor to the discomfort of the person wearing this type of heel.

PB 18409. U. S. WAR DEPARTMENT. QUARTERMASTER BOARD. Preliminary report of test of Buna-S rubber taps and heels (Project T-107). Feb 1943. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
On the basis of the tests conducted thus far, it is concluded that the taps have not been worn in the field a sufficient

length of time to determine the number of days required to produce the same degree of wear on both taps of each pair. Indications are that the wearing qualities of the Buna-S heels are superior to the wearing qualities of the regular issue heels.

PB 9686. WALL, F. T. Intrinsic viscosities. July 12, 1944. (WPB Gen Rept 15) Jul 1944. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a paper on the theory of measurement of intrinsic viscosity of the sols, an important property characterizing rubber-like polymers. A procedure for determination of intrinsic viscosity is given, and a diagram of the Ostwald viscosimeter is included. The report is dated at the University of Illinois, June 19, 1944.

PB 18285. WITTBORT, J. I. Investigation of synthetic rubber materials at low temperatures. (AAF Expt Eng Sect EXP-M56-4023) Aug 1942. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
Investigation to determine the freeze resistant properties of the different synthetic rubbers, and the effect of oil and gasoline immersion on synthetic rubbers. Samples tested include Chemigum, Buna, Ameripol, and 3 types of Neoprene synthetics. A description of testing procedure and equipment is given. Appendices contain a discussion of the results of tests on the different types of synthetics, and tables of low temperature properties including gas immersion, and volume change of each type. Future tests are suggested to determine the effect of long periods of exposure at low temperatures, and a dynamic shatter test to determine effect of an impact blow on synthetics at low temperature is also suggested. A diagram and photograph of testing equipment are given.

## STONE, CLAY, AND GLASS PRODUCTS

### German

PB 17545. BARNES, M.H. Synthetic sapphire and spinel production in Germany. (FIAT Final Report 655) 1945. 17 p. Price: Microfilm - 50¢ - Photostat - $2.00
There are 2 plants in Germany which produced synthetic sapphire and spinel boules during the war, the I.G. Farben plant at Bitterfeld and the Wiedes Karbid Werke at Freyung. Both plants employ the basic Verneuil process, the principles of which are known in the U. S. The details of German apparatus and process are revealed here for the first time. A process for hardening spinel bearings so that their performance approached that of sapphire and so that only 1 as much diamond was needed for fabrication was developed.

PB 17320. LAMON, W. A. and CARTER, J. S. Dyckerhoff Portland, Zementwerke A. G., Mainz-Amoneberg. (BIOS Evaluation Report 390) 1946. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a description of a cement plant which comprises 8 rotary kilns for Portland cement and 1 for white cement. The method of feeding slurry into the kilns by spraying is practiced, and, in order to cope with the heavy dust emission, each kiln has been provided with settling chambers and Siemens-Lurgi-Cottrell precipitators through which the kiln gases pass before entering the chimneys.

PB 13203. GERMANY, REICHSFORSCHUNGSRAT. Prof. Dr. Hacken. (Administrative correspondence with Prof. Hacken concerning the necessity of synthetic quartzes). (RFR 27). 1939-1940. 11 p. Price: Microfilm-50¢ - Photostat-$1.00

PB 11198. GREGORY, M. C. German flat glass industry. 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Visits made to the following plants in the German flat glass industry and their present condition are described: Vereinigte Glaswerke, Herzogenrath, near Aachen; Rheinische Spiegelglasfabrik-Ratingen, near Dusseldorf; Germania A. G.-Furth, Verbach, near Cologne; and Deutsche Libby-Owens Gesellschaft für Maschinelle Glasherstellung A. G. (Lelog)-Gelsenkirchen. Processes used at the plants are discussed. It is indicated that Allied policy should foster export of German glass.

PB 17552. GROSS, MALVERN J. Fused quartz manufacture in Germany. (FIAT Final Rept 536) 1945. 27 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes the methods of manufacturing clear fused quartz at the Osram G.M.b.H., Berlin, and the W. C. Herraeus Platinschmelz, Hanau, both methods differing from those in use in the U. S. Diagrams are included.

PB 18776. RUSSELL, RALSTON, JR. The electrical and technical ceramic industry of Germany. (FIAT Final Rept 617). Dec 1945. 144 p. Price: Microfilm - $1.50 Photostat - $10.00
Each section of this report includes a brief summary of a German factory working with ceramics. The manufacture of sintered refractory oxide parts, particularly sintered alumina, is well advanced. Sintered alumina bodies are used in all aviation and automotive spark plugs in Germany, whereas porcelain is still used for many automotive spark plugs in U. S. The methods of processing the alumina bodies is similar to U. S. practice, but the methods of fabricating the spark plug insulators by dry pressing or casting are less suitable than the two special pressing methods used most widely in U. S. The use of small amounts of magnesium fluoride to promote the development of the desired fine crystalline structure is of interest, as is also the use of fused but not calcined alumina by the leading spark plug manufacturer. Much consideration has been given in Germany to the possible of ceramics in gas turbines, and further work is outlined. The regular and special steatite insulations manufactured in Germany are similar in quality to U. S. steatite ceramics, but only the special steatites are recommended for high frequency application, whereas in U.S. regular steatite is widely used. Other developments of interest are: A low voltage porcelain of very low total shrinkage, semi-conducting and paramagnetic ceramic materials; a special type resistor for high temperature heating; ceramic-organic plastic tapes of high dielectric constant; moldable mica products; sintered boron carbide; porous filter medium for a wide variety of applications; and a vibratory method for fine comminution of hard ceramic materials. The data presented in this report were obtained from German personnel, and it was not always possible to check their accuracy.

PB 6494. THURNAUER, HANS. High frequency technical ceramic materials of Germany. Dec 1945. 32 p. Price: Microfilm-50¢ - Photostat-$3.00
This report covers the activities of some German producers of technical ceramics for high frequency insulation, including information on high and low tension insulating materials and on ceramics used for electroheating purposes. Practically all the production of high frequency ceramics came from Steatit-Magnesia A. G. and Hermsdorf-Schomburg Isolatoren G.m.b.H. Applications of ceramic materials in the design of variable air condensers were studied at a plant manufacturing radio components. Methods for making distance and organ vacuum tube spacers, high voltage condensers, diamond tools for grinding and drilling ceramic materials, and metal-ceramic vacuum tight joints are discussed in detail, and tolerance data are presented in tabular form. Appendices contain the questionnaire submitted to ceramic plants, German patent numbers of ceramic patents used by Steatit Magnesia A. G., and targets visited by investigators.

### United States

PB 16007. ARMA CORPORATION and OWENS-CORNING FIBERGLAS CORP., MFR. Report of tests and inspection on fiber glass insulation. (Naval Gun Factory OD 2897). 1946. 2 p. Price: Microfilm-50¢ - Photostat-$1.00

This report contains data on binding, ignition, moisture absorption, insulation resistance and breakdown tests performed on samples of fiber glass insulation. Results indicate that the fiber glass insulation is satisfactory for use in motors used on Ordnance equipment.

PB 11864. EHRICH, F. F. Label cement; aircraft casing. (AAF ATSC Memo Rept EEE 4-99). Aug 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Tests were conducted to determine the ability of label cement submitted for use on rubber aircraft casings, to perform satisfactorily under conditions of high heat and humidity such as may be encountered during storage and shipment. Tests were made on U. S. Royal Industrial Cement 6135 and 353 DS. These transparent cements were applied by brush over 2 paper labels. Then the section was exposed to a heat-humidity testing cycle for 10 days at from 70° to 130° F with 100% relative humidity. At the completion of the cycling period, visual inspection showed the label to be intact, but the cement lost its original transparency and the panting was therefore cloudy. Sample No. 6135 tested better in performance than sample No. 353 DS as it was less cloudy. Both were judged not acceptable adhesives.

PB 6595. POLYTECHNIC INSTITUTE OF BROOKLYN. The development of metallized-glass attenuating elements for X-band wave guide. (NDRC Div 14, Rept 525) Oct 1945. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes the mechanical and electrical development of metallized-glass plates for use as attenuating elements, in X-band wave guide. Practical methods are given for mounting the glass plates in the wave guide casings. Several types of impedance matching techniques for soft and Pyrex glass are described. Typical curves with film resistance, glass dielectric, glass dimensions and wavelength as variables are shown for the vane type attenuator together with a simplified circuit that can be used to explain partially the attenuation characteristics. Diagrams and graphs.

PB 12994. U. S. ARMY. QUARTERMASTER BOARD. Report of test of bowls, general purpose (toughened glassware). (QMB Project T-183). 1943. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Though glassware bowls do not break as easily as chinaware bowls, the edges chip more easily. Percentage of each type becoming unserviceable is about equal. Toughened glassware bowls are easier to wash and are cleaner after washing than vitrified chinaware bowls.

PB 16005. U. S. NAVAL GUN FACTORY. Glass cutting instructions. (O D 2933) 1942. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Diagrams and photographs supplement instructions on the cutting of plate or window glass and plastic-laminated glass.

## STRUCTURAL ENGINEERING

PB 16452. HUTCHINSON, W. G. and McCREA, ROBERT. A house for the study of materials under tropical conditions, (OSRD Report 4048). Jul 1944. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
Deterioration of military material in the tropics has led to the development of numerous methods which purport to simulate tropical conditions in the laboratory. This report describes the construction of a tropical house which will simulate tropical climatic conditions, and at the same time provide a typical microflora. Attention is also given to the introduction of tropical mites and insects which normally promote the dissemination of molds. The daily temperature is kept at 85 to 95° F and the nightly temperature at 70 to 80° F. The relative humidity is kept at 70 to 80 percent during the day and at 90 percent or above during the night. Photographs of the house and detailed drawings of its construction are included. This study was made at the Johnson Foundation of the University of Pennsylvania. Tropical deterioration.

PB 22462. ROWE, FRED I. Building materials-Germany. (FIAT Final Rept 389) Jan 1946. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
The primary objectives of the investigation of German building materials reported here were to find new developments in construction materials and construction equipment, new uses of previously known materials and equipment, and information about possible new substitutes for previously used materials. Inspection of a number of factories, plants, etc. were made and interesting details are noted. Mass concrete is used on grade crossings, bomb shelters, and for factories, though with the shortage of cement during the war, plants were moved to quarries and saltmines where little cement was required. On railroads, highways, river and harbor structures, the concrete was faced with brick, stone, or a bush hammered or washed surface. There were no rubbed surface finishes. Concrete products, all precast and prestressed, have reached a high use in the following fields: High and low pressure pipe, poles for power transmission lines, trusses, hollow slabs, railroad ties, tunnel liner rings, window frames, lintels. A special process for making cement for concrete pilings exposed to sea water is given. Wood is a minor building material, being used normally in peace times only for window sash, doors, trim and finish. Saw dust is used as a filler in concrete for floors, building brick and slabs, and wood shavings mixed with cement are extensively used in making insulating blocks and slabs. There was a generous use of steel in prewar and war construction. Welding was used very little in contrast to practice in the United States. No unusual uses except as piling were noted in the building field. Due to prestressing, only high carbon steels were used. Appended are a list of persons interviewed, extracts from a translation of an article by Otto Graf on vibrated concrete, and a bibliography. Photographs of structures are included.

PB 9811. SCHWARTZ, R. T. Desired properties and test procedures for low density materials for core of sandwich type construction. (AAF Eng Div ENG-56-M4595, Add. V). Aug 1944. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
The development of materials of sandwich type construction, having a combination of relatively thin faces of a high strength and a relatively thick core of light weight, required the establishment of minimum values and tests for the determination of such values. Usually these materials consisted of metal or plastic faces and cores of balsa wood or plastic materials. This report deals with the test procedures used in determining the properties of low density core materials and also gives the tentative minimum desired properties of such materials. Test procedures consider compressibility, specific gravity, impact, weathering chemical resistance, flammability, shear strength, warpage, tensile strength, modulus of rigidity, and torsion. Drawings and photographs illustrate the tests.

PB 17694. U. S. NAVY DEPARTMENT. BUREAU OF YARDS AND DOCKS. Construction of public works under contract, Chapter 16, revised, of the Bureau Manual. May 1944. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
This pamphlet, a revision of Chapter 16 of the Bureau Manual, covers such subjects as: Contract specifications and drawings; procedure in making a contract; field direction of work under contract; information to be furnished the contractor; field inspection; records.

PB 18764. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. Shed, transit, portable, steel, 32x98x12 ft. Erection procedure. (Tech Manual 5-9727) Sep 1945. 25 p. Price: Microfilm-50¢ - Photostat-$2.00
An entire set of plans are provided in this manual, showing all the necessary framing plans and details for the erection of these sheds. Diagrams, detailed drawings and photographs are also included.

## TRANSPORTATION EQUIPMENT

### AERONAUTICS

#### Aircraft

##### German

PB 14640. BARTSCH, E. and KOCHANOWSKY, W. Formblätter zu den Belastungsannahmen (Curves for determining loading). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik 1 B 5). (ALSOS Mission, Klotter File 11 A). n.d. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
The report discusses, mathematically, the strength of various parts of aircraft and their load capacity. The fuselage, tail assembly, rudder, etc., are considered. Various tables, graphs, and formulas are given, which are meant to simplify the determinations of the stresses and loads of aircraft. In German.

PB 14641. BRAUN, G. Die statische stabilität der drachenflugzeuge (The static stability of aircraft). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik I B 6). (ALSOS Mission, Klotter File 11 A). Oct 30, 1940. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
This report gives a useful definition of static stability and shows how to determine the degree of stability. The moment coefficients of the body, wing and tail assemblies are given. The moment coefficient of the rigid and movable rudder is also worked out. Tables, graphs, formula, bibliography. In German.

PB 14652. RICH, K. Katapulte für seeflugzeuge (Catapults for seaplanes). (Reichluftfahrtministerium, Ringbuch der luftfahrttechnik I D 2). (ALSOS Mission, Klotter File 11 A). Mar 30, 1940. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
The report reviews the development and essential elements of catapult construction. The present German methods of catapulting large seaplanes are described and foreign methods only superficially treated. Drawings of specific catapult models are given showing slings, tracks, and cranes for hoisting planes aboard. Diagrams and bibliography are included.

PB 18606. FREAS, A. D. and HOUGHTON, R. W. Identification of certain materials in a captured German Gotha 242 glider. (AAF Eng Div ENG-56-M4895.) Sep 1944. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Materials Laboratory report on the identification of wood and plastic parts from a captured German Gotha 242 glider. Truss members and filler blocks were probably Scotch or Australian pine. Plywood gusset plates of 5 plies of beech did not delaminate after 3 hours of boiling, so the glue used was probably phenol-formaldehyde, as only this would be expected to give these results. Transparent plastic material gave the odor of methyl methacrylate on burning and is probably Plexiglas or Lucite. One page will reproduce poorly.

PB 18939. HOLMAN, D. M. and others. Visits in American and French zones: aircraft and aircraft engines. (BIOS Final Rept 170, Items 25, 26). Oct 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Brief reports of visits to 19 German aeronautical establishments including research laboratories and airports as viewed by a British intelligence team. Testing equipment and manufacturing techniques as well as descriptions of unusual aviation equipment are included as subject matter. Many of the places visited had suffered heavy bomb damage but some offered interesting study and unusual developments in design and manufacture are described.

PB 14642. KIEL, G. Die messung des flugstaudrucks u. statischen drucks bzw. der fluggeschwindigkeit und höhe. (The measurement of dynamic air pressure and static pressure in relation to flight speed and altitude). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik 187). (ALSOS Mission, Klotter File 11 A). Oct 31, 1940. 1[illegible] Price: Microfilm-50¢ - Photostat-$1.00
Report deals with the problems of obtaining actual measurements of air pressures. The relationship between air velocity and the relationship between air speed and pressure is discussed. In this connection, monoplanes and biplanes are compared. The effect of rain and ice on wings is also noted. Graphs.

PB 14643. LUGNER, H. and others. Die seitenstabilität der flugzeuge (The lateral stability of aircraft). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik I B 8). (ALSOS Mission, Klotter File, 11 A). Sept 15, 1940. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
The report discusses the theory of lateral stability and its practical application as in blind or instrument flying. The use of the rudder for contact or instrument flight is also considered in this respect. Formulas are given for the measurement and calculation of aerodynamic stability. Tables, graphs, bibliography. In German.

PB 14639. PÖLL, A. Flugleistungen (Flying power). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik I B 4). (ALSOS Mission, Klotter File 11 A). Feb 1, 1938. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
The report discusses formulas to measure the efficiency of aircraft under certain flight conditions. The efficiency of the engine at high altitudes, the resistance and other hindrances in flight, problems of high speed, velocity, acceleration, diving tests and others were considered. Graphs, tables, bibliography. In German.

PB 14646. THOMAS, A. Über Wesen und bedeutung der flugeigenschaften und ihre prüfung (On the nature and importance of the properties of flight and the testing of the properties). (Reichsluftfahrtministerium, Ringbuch der luftfahrttechnik I B 11). (ALSOS Mission, Klotter File A). Feb 15, 1938. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
The report discusses the properties of flight and evaluates their importance. Qualitative treatments and test methods are described briefly. The difficulty of making quantitative determinations are also described. There is a discussion of stability of planes in all three axes. The influence of rudder control and the effects of spinning are also presented. In German.

PB 14630. UHLEMANN, K. Dämpfungsflüssigkeiten. (Shock and vibration absorbing liquids) (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik IV C 10) (ALSOS Mission, Klotter File 11 D) Aug 1938. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
The report covers the use of hydraulic fluids in airplane landing-gears and compasses; it describes the qualities of the various oils and also their distillation. Tabulations and graphs included in text. In German.

PB 18128. VON KARMAN, THEODORE. Interview with Dr. Lippisch at USSTAF on 28 May 1945. (U. S. Strategic Air Forces in Europe. Tech. Intell. Rept. I-55). May 28, 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The interview was concerned with German developments in tailless aircraft and brings out design and research data which was later applied to the Me 163A rocket plane. Results of tests on rocket motors and later flight tests showed such plane to be capable of 1003 Km/hr. (about 620 m.p.h.). Rocket fuels and their use in the Walter motor are discussed and the development of the Me 163B is reviewed. Further work on a twin turbo-jet engine fighter and the P-13, a ram jet plane are described.

PB 14637. WENKE, H. Die bestimmung des schwerpunktes (Determination of the center of gravity). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik I B 2). (ASTC Mission, Klotter File 11 A). May 13, 1937. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Report describes experimental methods to determine the center of gravity of aircraft. Weight of the ship and equipment is considered. In aircraft, the center of gravity is obtained while craft is suspended in air or resting on the water. The method of obtaining the center of gravity by suspension of the craft by means of a crane is described. Simple formulas are given for these calculations. Drawings, diagrams. In German.

PB 14979. WILLMS, W. Der flugzeugschall, seine entstehung, ausbreitung und verminderung. (Airplane noise, its origin, spread and suppression) (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik V D 2.) (ASTC Mission, Klotter File 11 E) Dec 1937. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This report classifies the noises of a plane as exhaust noise and propeller noise, the latter being analyzed as tonal noise whose pitch is determined by the propeller speed and contains both even and odd harmonics, and the hum of turbulence behind the propeller. Against exhaust noise, silencers are recommended; against propeller noise, four-blade propellers and lesser rotation velocity. For noise damping in the fuselage, sound absorbing paneling. Graphs and drawings. Bibliography. In German.

United States

PB 16250. BAIRD, R. A., III. Twisting of front canopy roller bracket No. 26034-P43A airplanes. (AAF Expt Eng Sect U-EXP-M-51-5373.) Dec 1941. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Unsatisfactory report on twisting of front canopy roller bracket on canopy frame assembly, allowing the canopy lower front rollers to run sideways in their track. This condition is considered the result of excessive flexing of the relatively unsupported bracket when subjected to the various loads encountered in service, the most serious of which is its use as a handhold by personnel entering or leaving the cockpit. Drawings have been prepared and released on a reinforcement bracket assembly and its installation.

PB 16266. BAIRD, R. A., III. Wearing of wing center section assy. by flap-P-43 airplane. (AAF ATSC Memo Rept U-EXP-M-51-5008.) Jul 1941. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Unsatisfactory report on damage to center section wing assembly caused by trailing edge of flap assembly wearing into it when the flaps are closed. Condition may have been caused by faulty fabrication or by lack of care when handling the plane by ground personnel. Skin should be straightened to prevent its wearing on the stringer and acting as a stop to the flap action.

PB 16271. BARD, D. E. Ring cowl brackets No. 28256 YP-43 airplane. (AAF ATSC Memo Rept U-EXP-M-51-5018.) Jul 1941. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Unsatisfactory report on failure of ring cowl bracket on YP-43 airplanes. These are fabricated of 065-inch aluminum alloy sheet. They are used to attach engine cowls to the engine cylinder rocker boxes and support the air duct as well. It is concurred in that brackets are fabricated of too light gauge stock to withstand the service requirements, and should be replaced with brackets of aluminum alloy sheet (24S) in 0.081-inch thickness.

PB 16278. BASHARK, E. Report on A-N Conference on hydraulic equipment No. 63-42, September 9-11, 1942. (AAF Expt Eng Sect EXP-M-51/M752, Add. 13) Sep 1942. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Conference to discuss freezing the design of 5 items of hydraulic equipment for standardization. These items included the directional control valve, pressure regulator, self sealing coupling, brake valve, and detachable end fitting hose and are considered the best units manufactured insofar as performance, production and maintenance were concerned. Until standardization is effected, it is recommended that units which comply with the envelope drawing, and the existing detail specification should be considered acceptable on military aircraft.

PB 16630. COOKE, C. E. Gun bracket installations in wing assembly - A-17 airplane. (AAF Eng Div U-EXP-M-51-4945) Jun 1941. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
A memorandum report clarifying the installation procedures to be used for wing gun mount brackets on the A-17 airplane.

PB 16273. DUDZINSKI, E. C. Failure of pilot's emergency hatch release mechanism handle No. 63-32133, BT-15 airplane. (AAF ATSC Memo Rept U-EXP-M-51-5050.) Aug 1941. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Unsatisfactory report that the grip ends of the emergency hatch release handles are breaking. Two possible reasons are; during inspection or repairs service personnel may have attempted to operate handles when in locked position, or handles may have been improperly safetied to the lugs in the emergency hatch release housing.

PB 16629. FAIRCHILD, A. C. Tail wheel shimmy O-47A airplane. (AAF Expt Eng Sect U-EXP-M-51-4932.) Jun 1941. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Unsatisfactory report from Langley Field about tail wheel shimmy as a result of metal burring of the tail wheel post assembly and shearing of the pin that passes through the splined mast and post. As in previous reports, Experimental Engineering recommends a trial installation of a plain bearing assembly to correct this condition, and asks for reports from activities which have tried such installations.

PB 16269. GRANT, D. Failure of landing gear lock assy. No. A-103972, B-10BM airplane. (AAF ATSC Memo Rept U-EXP-M-51-5016.) Jul 1941. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Unsatisfactory report on failure of landing gear lock assembly during take-off. Accident may have been due to shearing of the lock plunger or inadvertant retraction of landing gear before take-off. Either could have caused the landing gear to be thrown back forcefully enough to force it beyond its normal travel and pry the drag strut roller out of track. Failure of both lowering cables occurred.

PB 16270. GRANT, D. Freezing of flight controls at high altitudes, YP-43 airplane. (AAF ATSC Memo Rept U-EXP-M-51-5034.) Jul 1941. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Flight testing of YP-43 airplane at altitude above 30,000 feet brought reports of difficulty caused by the fact that the trim tab, aileron and elevator controls stiffen at temperatures below -40 C. due to solidifying of the lubricating greases in the sealed ball bearings used in the control system. Manufacturer was requested to change to Specification 3588 grease instead of Specification VV-G-681 and VV-G-671 greases.

PB 16280. GRUDIN, DANIEL. Preliminary study of motion levered suspension landing gear (Douglas A-20 airplane.) (AAF Eng Div ENG-51-AD1095.) Oct 1943. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Preliminary analysis of the levered suspension landing gear as obtained from motion picture studies of the landing gear while in operation. Photographic studies were made of landing, take-off and taxiing with brake applications of various magnitudes. Strain gage measurements were taken. Conclusions of a study of this data are given.

PB 16593. HAUGEN, V. R. The theory and operation of tricycle type alighting gears. (AAF ATSC Memo Rept EXP-M-51/AD957.) Dec 1941. 11 p. Price: Microfilm-50¢ Photostat-$1.00
Report on the principles of the tricycle type alighting gear giving pertinent information gained from service experience and tests, and presenting suggestions relating to the pilot technique peculiar to such gears. Tricycle landing gears make possible operation of aircraft at exceedingly high wing loadings and has the advantage of directional stability on the ground and freedom from a tendency to overturn even under heavy braking. Best method of landing, and its landing performance are given, with the recommendation that these be incorporated in a technical order. Small diagrams demonstrate the forces acting on the undercarriage when rolling straight forward and when skidding to one side, and the stabilizing tendencies of a tricycle airplane.

PB 16261. NICOL, J. T. Failure of bulkhead reinforcement beam "U" section No. P-103736-8-B-108M airplane. (AAF Expt Eng Sect U-EXP-M-51-4709.) Feb 1941. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Comments on an unsatisfactory report on failure of bulkhead beam top "U" section located at fuselage station no. 4A. This is the part upon which the tow target windlass clutch control bracket is mounted. It failed at the point where the 3 attaching bolts attach this part to the bulkhead. It is concluded that the force required to operate the tow target windlass clutch control is transmitted through the bracket to this "U" section. After several operations of clutch control the metal failed due to fatigue. The bulkhead reinforcement beam is fabricated of aluminum alloy 24St.0.040 inch thick, and is not of sufficient thickness or strength to withstand the load. It is recommended that the newly designed bulkhead reinforcement be installed on all B-10 and B-12 airplanes at the time of installation of the C-5 tow target windlass. It should also be installed on all planes having tow target installations as soon as practicable.

PB 18669. U. S. ARMY AIR FORCES. OFFICE OF FLYING SAFETY. AAF accident trends Dec. 1941 to Dec. 1944. 1945. 47 p. Microfilm-50¢ - Photostat-$4.00
The accident trends are recorded by principal aircraft models and also by air forces and commands. The entire booklet is a series of graphs showing all accidents, fatal accidents, fatalities, and aircraft wrecked.

PB 18670. U. S. ARMY AIR FORCES. OFFICE OF FLYING SAFETY. RESEARCH AND STATISTICS DIVISION. Accident trends, sixth edition. Dec 1943. 204 p. Price: Microfilm-$2.50 - Photostat-$14.00
Gives the same information as the 4th and 5th editions and additional data for November 1943. For abstract of contents see PB 18672 and PB 18673.

PB 18668. U. S. ARMY AIR FORCES. OFFICE OF FLYING SAFETY. RESEARCH AND STATISTICS DIVISION. Accident trends, seventh edition. Jan 1944. 124 p. Price: Microfilm-$1.50 - Photostat-$9.00
Data presented covers the additional period of December 1943. See PB 18672 and PB 18673 for abstract of contents of this report. Additional information is included in this edition which gives a six-months summary of tables showing accidents by aircraft type under sub-commands. Comparative rates for nine selected tactical aircraft are shown in graphs, and more complete information on nature and causes is given in this edition. Charts showing the number of accidents have been omitted in this report.

## Instruments

PB 14648. KIEL, G. Die ermittlung der fluggeschwindigkeit bzw. des flugstaudrucks durch eichflüge. (The determination of air speed by dynamic pressure instruments). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik I B 10). (ALSOS Mission, Klotter File 11 A). May 15, 1938. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
The ordinary air speed measurement is incorrect due to variations of the displaced air currents. To obtain the true speed, aerodynamic instruments must be used which take the air currents into consideration. The report describes a few methods for determing the true velocity of aircraft. Graphs, drawings, bibliography. In German.

## Engines and Propellers

German

PB 18928. BARLOW, F. C. and others. Reciprocating aero engines: Daimler Benz. (BIOS Final Rept 147, Item 26). Aug 1945. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
This is a report of an investigation the main object of which was to discover the lines of development followed by Daimler Benz on reciprocating aero engines, and to compare the inspection procedure with British practice. In this investigation the main factory at Unterturkheim, and the dispersed units at Faurndau, Eislingen and Backnang were inspected and technical personnel were interrogated. It was evident that Daimler had have lagged behind the equivalent British and United States practice, this was thought to be due to excessive government control, adverse effects of bombing, inadequate dissemination to the industry of intelligence reports, poor co-ordination and interchange of information between units engaged in similar work, and low grade and scarcity of nickel, copper, and high grade fuels for testing. Photographs of equipment and drawings are included.

PB 14654. KLINGEMANN, G. Systematische luftschraubenversuche (Systematic testing of propellers). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik I C 6). (ALSOS Mission, Klotter File 11 A). Feb 15, 1938. 15 p. Price: Microfilm-50¢ - Photostat-$2.00
Report describes the arrangement of the results of tests. The various influences on the propeller and their evaluation are discussed. Various curves interpret these influences, graphically. Seven pages of bibliography (in English) are given concerning the measurements of propellers, blade breadth and thickness, resistance and other factors. Most of these are N.A.C.A. reports.

PB 14607. STEIGENBERGER, O. Einfluss der kühlung auf konstruktion und betriebsverhältnisse luftgekühlter flugmotoren. (The effect of cooling upon the construction and working conditions of air-cooled aircraft engines.) (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik III A 13.) (ALSOS Mission, Klotter File 11 C.) Nov 1938. 24 p. Price: Microfilm-50¢ - Photostat-$2.00
The problems of air-cooling of airplane engines are discussed. Many graphs illustrating various temperatures at cylinders, exhaust manifolds, etc. are given together with formulae, by which such calculations have been attained. In German.

PB 14653. WALCHNER, O. Berechnung der eigenschaften einer luftschraube von gegebener form (Calculating the properties of a propeller of a given shape). (Reichsluftfahrtministerium, Ringbuch der luftfahrttechnik I C 7). (ALSOS Mission, Klotter File 11 A). Mar 10, 1938. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
Formulas are given for calculating propeller properties. Sample calculations are given. Propellers that are free wing and propellers in test-stands are discussed. Tables are shown for checking propeller properties. Graphs and bibliograph are given.

Japanese

PB 16800. KERGAN, H. B., JR. Japanese rocket devices for assisted take-off for aircraft. (AAF. Air Tech Intelligence Group Rept 41). Nov 1945. 5 p. Price: Microfilm-50¢ - Photostat-$1.00

Interrogation of Lt. Commander Hino gives formula for burning material used for all rockets, and standard cylindrical propellant container with venturi exit orifice. Rockets as assisted take-off devices for land planes reduced the take-off 20%. Three 9-second rockets in the after fuselage permitted a more accurate suicide dive. Rockets were also used as a power source for land catapults. A table is appended of 16 rocket types with data on each, including total weight, weight of rocket charge, maximum thrust, mean thrust, duration in seconds, weight of explosives and maximum range.

United States

PB 16592. ABELL, R. F. Burning black powder charges in the IJ-15-1 intermittent jet engine. (AAF Eng Div TSEPL-5-673-57.) Apr 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Results of tests conducted to determine the pressures developed by burning black powder charges in the IJ-15-1 intermittent jet engine. Engine was partially buried in the ground to minimize scattering of pieces should one of the charges cause the engine to blow apart. Instruments used and their mounting to insure good pressure sensitivity and yet have guaranteed operation are discussed. Exhibit A is a photographic reproduction of the pressure traces of the 6 charges. Maximum pressure recorded was 23 p.s.i. using a 450 gram powder charge. This pressure was insufficient to actuate the fuel valve of the engine. A second more confined charge, used simultaneously with the first is recommended to operate the fuel valve.

PB 6192. BERGER, A. L. Failure of lubrication pumps in the B-2 and B-22 turbosuperchargers installed in B-24 airplanes. (AAF ATSC Memo Rept TSEPL-5-522-265). Jan 1945. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
Cause of failure of the lubrication pump in the B-2 and B-22 turbosupercharger is the employment of contaminated oil, improper filtering means, and cavitation caused by clogged filters. Remedy would be the installation of a completely separate lubrication system in which the lubricating oil used would be suitable for operation with the type of pump and bearings employed in the turbosuperchargers, as used on the B17, F38 and F47 installations. The other method would be to locate or develop a filter of such capacity that the drop to the filter would not exceed ½" of mercury and with screening characteristics which would prevent any foreign metal particles from ever getting into the supercharger oil pump and lubrication system. Factual data contains bibliography of 8 items. Photographs of the equipment are appended.

PB 6193. BOROFSKY, S. L. Installation of separate turbosupercharger oil system in B-24 airplane. (AAF ATSC Memo Rept TSEPL-5-522-263). Jan 1945. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Extensive oil pump failures of the turbo superchargers in B-24 airplanes can be attributed to two causes: (1) Fouling of the oil filter, preventing proper lubrication of the worm drive and causing failure on continued running; and (2) engine particles jamming the oil pump. An individual lubrication system designed for the B-24 means an additional weight of approximately 10 pounds per nacelle, which represents actually the extra 1½ gallons of oil since the assembly weight of the aluminum and dural is cancelled by the removal of the oil filter and long oil line. The installation of an adequate oil filter to the present system, would result in an approximate weight increase equal to that of a separate system with few of its advantages. Photographs of the equipment are included.

PB 16610. ERKIBELBIS, L. L. Pressure traps between packings. (Army Air Forces Expt. Eng. Memo Rept. EXP-M-51/M752, Add. 9). Mar 19, 1942. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
Laboratory tests are reported on "O"-ring packings when installing more than one ring on a piston head. It has been the practice in the past in some designs for the aircraft industry to put two or more "O"-ring packings in one gland for a higher factor of safety, or to install "V"-ring packings lip to lip instead of back to back. These types of installations cause oil to be trapped between the packings causing pressure traps. As a result of tests it is recommended that "O"-ring packings be installed with only one ring in each gland, while "V"-rings should be installed back to back. Appendix contains table, performance curve, and drawings.

PB 8165. ERICOS, IVAN H. and others. Estimated performance of Westinghouse jet motors. (NAVAER PAD Rept M-13). Feb 1943. 26 p. Price: Microfilm-50¢ - Photostat-$2.00
This report gives the results of performance computations upon the two Westinghouse units. The data is intended to serve for the computation of full power performance at 1500° operating temperature and in some cases for the analysis of fuel power operation at 1200°F. Data was given in full for but one exit nozzle area ratio (.95) although the curves were discontinued below an R.P.M. of 9000 and 18,000 for the two units since it is necessary to open up the nozzle for idling operation in order to reduce the internal temperature. Performance charts are included.

PB 16252. ERNST, P. E. Excessive wear of engine starter, handle extension, universal joint No. 25904-F-43A airplane (AAF, Expt Eng Sect U-EXP-M-51-5359). Dec 19, 1941. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Unsatisfactory Report that the universal joint were excessively at the point where the pin joins the two ends of the universal together after only 23.35 hours service. Investigation revealed that this type of joint is not of sufficient strength to withstand the heavy loads imposed upon it. Its service life is inversely proportional to the number of times the engine is started by means of the starter handle extension. The universal joint should be of sufficient strength to withstand considerable usage, therefore it should be replaced with universal joint no. X42A1120.

PB 6418. HAYNE, D. C., JR. Use of Ault and Wiborg 314 propeller compound by the North Atlantic Wing, ATC. (AAF ATSC Memo Rept ENG-52-581-136-89). Feb 1944. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
Use of the A-W314 propeller anti-icing compound on cargo and tactical aircraft in the North Atlantic was studied. The compound can be applied with a fair degree of consistency if thinned with isopropyle alcohol in proportion to the outside air temperature where the application of the compound is to be made. This will eliminate excessive vibration caused by uneven coating of propeller blades. Removal of compound from propeller blades is necessary, however difficult, before recoating, but in some cases touch-up can be accomplished. Additional anti-icing protection for propellers is not desirable if it involves a loss in performance. Exhibits A, B, and C report difficulties encountered at Presque Isle, Maine, in the use of the anti-icing compound.

PB 16244. RAMKE, W. G. Carbon air rings and springs from a Lawrance Engineering and Research Accessory Power Plant. (AAF ATSC Memo Rept ENG-54-656-8840.) Nov 1943. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Failure by chipping and cracking of carbon air rings from Morganite Brush Co. and their mating governor seal springs. Spectrographic analysis showed similar composition in all 3 rings, though 2 failed and the third was in good condition. Force exerted by the spring compression was measured. The number 3 spring was slightly stronger. The other 2 springs were oversize in wire diameter and in coil diameter. Good seating can not be obtained in service with these springs due to their design. Failure might be caused by the fact that they exert higher unit pressure at some points of contact with the air ring assembly than at others, causing heating and a breakdown of materials.

PB 7293. SCHROEDER, O. H. Dust conditions on flying field at Savannah Air Base. (AAF ATSC Memo Rept EXP-M-57-525-58). Feb 1942. 3 p. Price: Microfilm-50¢ - Photostat-$1.00

This report gives the results of observations made to determine the effect of dust on the airplane engine, as excessive engine wear during warm-up, taxiing and take off periods. Observations made on a number of B-26 and A-20 airplanes flying on maneuvers showed that little dust entered their air intakes during 10-15 minute warm-up, due to arrangement of planes with respect to each other. In taxiing, each ship was exposed to dust stirred up by the airplane in front. A test showed a concentration of dry silica sand of .017 gram per cubic foot of air. In take-off, the dust conditions varied with the amount of time elapsing between take-offs, and the ship was well clear of a dusty atmosphere after approximately 20 seconds.

PB 16306. TANCHEL, MELVIN. Test of anti-icing parts for propeller from P-40 airplane, A.C. No. 40-383, Whirl test 1526. (AAF, Tech Rept 4709. Nov 1941. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
Test to determine the durability of the anti-icing parts mounted on a Curtiss propeller hub model C-5315-8 and blade design 6140cl.5 -12 for the P-40 airplane when submitted to an over speed test for 1½ hours at 143% rated propeller shaft speed or 1860 r.p.m. Anti-icing equipment consisted of three ¼ inch diameter tubes 1½ inches long, 3 couplings, 3 rubber shoes, 3 collector rings, and one slinger ring. Slight modification of the propeller and spinner was made in order to mount the assembly. The rubber shoes failed in bonding after 1½ hours of testing, probably as a result of faulty installation, as other such mountings had proved successful. Remainder of the other anti-icing parts passed the test successfully. Photographs illustrate the results of the test.

Operations

German

PB 14644. GÖTHERT, B. Der abflug von landflugzeugen (The take-off of land planes). (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik I B 9). (ALSOS Mission, Kletter File 11 A) Oct 15, 1937. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
The report describes the various considerations in a take-off such as starting, take-off run, ascent, accelleration, etc. Formulas are given for the necessary calculations. Tables, graphs, and bibliography are included. In German.

United States

PB 16275. BERRE, H. Ground handlings of airplanes T.O. 01-1-50. (With addendum 1, dated 30 March 1942). 11 October 1941. (Army Air Forces. Experimental Engineering Division EXP-M-51-5200 and add, 1). 1941. 8 p. Price:
Study has been made to determine loads that may be developed on airplanes by wind forces while moved on the ground. Investigation was based on a 75 m.p.h. wind and upon the assumptions that the wind direction with respect to the airplane was in 3 positions. New instructions for the moving of airplanes in the open must necessarily be the minimum precautions and station engineering officers should use their own ingenuity in further preparing the airplanes for anticipated high winds. T. O. 01-1-50 Figure 1 should be changed to conform to drawing H 38A 355 change "A" as given in this addendum. Towing of airplanes is also taken up.

PB 16302. BROWN, R. S. Practicability of graphical presentation of power control for aircraft. (Army Air Forces. Eng Div TSEAL-6D1-129). 1945. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
A study was made of power settings for various type aircraft to see if it was practical to use RPM and manifold pressure curves as a guide for such settings without considering speed, weight or altitude. It was decided that efficiency loss was not excessive if graphs were used for aircraft having turbo-superchargers but it was not a good system for those having gear-driven superchargers due to the difficulty in graph interpretation. Each airplane presents an individual problem necessitating its own particular graph. Power setting charts are included for the B-29, P-47C, D, B-24G, H, or J, P-51, B-25H, and C-47. A table showing settings under four different conditions is also shown.

PB 6154. PARKE, NATHAN GREER III. Some aspects of glider take off. (NAVAER PAD Rept R-18). Oct 1942. 75 p. Price: Microfilm-$1.00 - Photostat-$5.00
Study of engineering aspects of glider take off in order to find as many of the inherent potentialities, compromises, and limitations as possible by analytic methods, as a sound basis for practical testing of glider take off methods. There are 3 general types of glider acceleration (1) High initial acceleration gradually decreasing, which is easiest on the tow plane (2)uniform acceleration which is easiest on the glider (3) low initial acceleration gradually increasing which gives the shortest take-off run. The main body of the report consists of equations on the forse on the tow plane, power required for glider take off, glider take off at constant speed and method of reducing lateral spread of guide posts during take off. There is a chapter on the general theory of glider take off and the mathematical considerations involved.

PB 16303. RUBIN, HERMAN H. Interim report on analysis and evaluation of factors ordinarily neglected in calculation of aircraft range. (Army Air Forces. Eng Div ENG-43-16). 1944. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
The factors involved have been arranged in groups of related phenomena. The groups and their effect on range are as follows: (a) temperature of fuel, (b) weight and balance, (c) pilot technique, (d) airplane deficiencies, (e) atmospheric conditions, (f) combat conditions, and (g) miscellaneous. Under each group are three to six divisions and each of these is analyzed in detail as to its influence on aircraft range. Graphs illustrate the results of investigations made of the various factors, and two photographs illustrate combat formations.

PB 18672. U. S. ARMY AIR FORCES. OFFICE OF FLYING SAFETY. RESEARCH AND STATISTICS DIVISION. Accident trends, fourth edition. Oct 1943. 148 p. Price: Microfilm-$1.50 - Photostat-$10.00
The additional data presented in this edition give trends through September, 1943. It deals with the accidents first, according to the air force, command, and stage of flying training in which they occur; second, according to types and models of aircraft involved; and third, according to the nature and cause of accidents. It is a statistical record supplemented by graphs interpreting the tabular information by showing monthly rate trends of accidents. See also PB 18673.

PB 18671. U. S. ARMY AIR FORCES. OFFICE OF FLYING SAFETY. RESEARCH AND STATISTICS DIVISION. Accident trends, fifth edition. Nov 1943. 172 p. Price: Microfilm-$2.00 - Photostat-$12.00
This edition is compiled on the same plan as the 4th edition (see PB 18672) and uses the same figures published in it, with additional data for October 1943. There is a more complete introductory discussion in this report than in previous ones.

PB 18559. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. Disassembly and loading of standard engineer equipment for transport in C-47 cargo plane. (Tech. Bulletin ENG 33A) Jul 1944. 251 p. Price: Microfilm-$3.00 - Photostat-$17.00
This Technical Bulletin covers the transport of engineer equipment in the C-47 cargo plane. Disassembly, plane load groups, loading, and subsequent reassembly of each item are included. Diagrams and photographs supplement the text. Information is given on planning the loading of such equipment as a whole and actual loading instructions for each individual item.

### Maintenance and Repair

PB 16283. JUKKOLA, E. E. and PERENY, L. Corrosion of airplane metal surfaces. (AAF Eng Div ENG-56-M-4637.) Dec 1945. 20 p. Price: Microfilm-50¢ - Photostat-$1.00
A report on the prevalence of corrosion on metal surfaces of airplanes at various Texas training centers. Corrosion was found due to salt water, battery acid, gun powder, residues, dissimilar metal contacts, and high detergent concentration in steam cleaner solutions. It is considered that suitable painting of airplane metal surfaces affords insurance against corrosion, particularly of inaccessible or difficult to reach parts, and provides a means of minimizing maintenance of corroded parts at a very low cost. An appendix reviews conditions found at each field. It contains 13 pictures of different types of corrosion found and the reason for the condition.

PB 16828. KIERGAN, E. B. Method and equipment for handling patrol and sea planes. (Japanese). (AAF. Air Technical Intelligence Group Rept. 9). Oct 19, 1945.
Interrogation of Japanese commanders on refueling, take-off and landing, and repair of seaplanes.

### Training and Training Devices

#### German

PB 16691. GLASSMAN, L. H. and BLANCHARD, H. D. German aircraft and anti-aircraft gunnery training targets. (CIOS Report, File XXXII-117, Item 2). Aug 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
A discussion of German aircraft and anti-aircraft target equipment during the war. Stationary targets on ground and water, moving targets on ground and water, kite and balloon targets, and targets towed by aircraft are listed. In the field of aircraft tow targets, it was surprising to note how little emphasis had been placed on high speed towing. Drawings of targets are given.

#### Japanese

PB 16795. BEARDSLEY, G. F. Japanese navy training equipment and devices - report on. (AAF. Air Tech Intelligence Group Rept 50). Nov 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
Interrogation of Japanese naval officers on Japanese naval trainers including Link trainer, landing trainer, night landing trainer, torpedo trainer, horizontal and dive bombing training equipment and recognition training equipment. Explanation of the characteristics of some of these, (including drawings) is appended. The drawings will not reproduce well.

PB 16817. SPANGLER, S. B. Pilot training in the Japanese navy. (AAF Air Tech Intelligence Group Rept 20). Oct 1945. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
Interview with Capt. Mieno, director of Training, on the training program of Japanese naval pilots, including information on the source of supply, physical examination, training schools, course of instruction, length of training and distribution of personnel to the different units. Appended are charts on Japanese naval aviation personnel, but no translation of Japanese text is given. Japanese air training program appears to have been well conceived and well executed. The state of training was higher than was estimated by our own operating units. A series of charts with explanations in Japanese is included.

#### United States

PB 20533. U. S. ARMY AIR FORCES. Instrument flying. Instrument approach system. (Tech. Order 30-100F-1) Jan 1945. 29 p. Price: Microfilm - 50¢ - Photostat - $2.00
The AAF instrument approach system and its component pieces of equipment are described as are the procedures for making such an approach. The localizer and glide path phases of such approaches are explained. Orientation procedures are presented and diagrams help to explain them. A syllabus for instructors use is included and has three lessons for teaching purposes. Many illustrations of all types aid in understanding the text.

PB 20534. U. S. ARMY AIR FORCES. Instrument flying, advanced, with radio aids. (Tech. Order 30-100B-1) Jan 1944. 78 p. Price: Microfilm - $1.00 - Photostat - $6.00
This is an instructional manual which was used by the AAF in its training schools. Much use is made of pictorial and graphic illustrations to supplement the text. The information includes descriptions of the operation and use of altimeters, dead-reckoning computers (E-6-B) and various radio aids including the radio compass. The techniques necessary for flight planning and for instrument flying are discussed and foul weather flying precautions are explained.

PB 20535. U. S. ARMY AIR FORCES. Instrument flying, basic, without radio aids. (Tech Order 30-100 A-1) Jun 1943. 85 p. Price: Microfilm - $1.00 - Photostat - $6.00
This training manual gives information to aid the new pilot in understanding the physiological effects that may be expected during instrument flying and how to counteract them. It also gives an elementary explanation of aerodynamics and its effect on aircraft performance. A chapter is devoted to the fundamental flight instruments and their operation, and an analysis is made of maneuvers involved in basic instrument flying. Part II gives procedures to be followed in instructing students in instrument flying. It is primarily for use by the instructor in ground and flight checks. Many illustrations of all types help to explain the text.

PB 16860. U. S. ARMY AIR FORCES. AIR TECHNICAL SERVICE COMMAND. Operating instructions, He-162 A - 1, A - 2, Part I: Pilots service instructions. (T-2 Translation 408). Apr 1945. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
A manual giving the flight and handling characteristics of He-162 airplane and detailed operating instructions for the pilot.

## LAND TRANSPORTATION

#### German

PB 16711. BECKER, C. B. Research and development in hydraulic couplings (fluid power transmissions) performed by J. M. Voith of Heidenheim/Brenz. (CIOS Report, File XXVII-13, Item 31). 1945. 35 p. Price: Microfilm-50¢ - Photostat-$3.00
Part I is a brief statement on the activities of the J. M. Voith Machine Company on torque converters and hydraulic couplings. Firm can make from 400 to 800 hydraulic couplings (for locomotive use) per year. Part II reports on tests with different shapes of circuit and increased number of vanes for hydraulic couplings. The task was to find out a form of vanes and profiles which could meet better the contradictory requirements of torque and slip of different applications than the present form now does it. An appendix contains a series of characteristic curves and dimension charts covering these tests.

PB 17387. GERMANY. DEUTSCHE REICHSBAHN-GESELLSCHAFT EISENBAHNZENTRALAMT. Technical drawings of railroad equipment (MIS VII 67: 7002639) 1933. 38 p. Price: Microfilm-50¢ - Photostat-$3.00
A collection of 27 drawings of German railroad equipment.

PB 14754. HEINRICH HERTZ INSTITUT FÜR SCHWINGUNGS-FORSCHUNG. Schwingungsmessungen 1929 bei wechselstrom-triebwagen und D-wagen. (The measurement of vibrations in railway motor cars driven by alternating current and in express passenger cars.) (ALSOS Mission, Klotter File S D) Mar 1930. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
The measurements have been made on both types of cars at different speeds, the appendix contains numerous graphs showing the amplitudes, directions and the rate of the vibrations. In German.

PB 16716. SCHROEDER, WILLIAM M. History of general automotive development at the Stuttgart Research Institute. (CIOS Report File XXXII-61, Item 19). Aug 1945. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
The body of this report consists of a translation of a summary of automotive development at the Stuttgart Research Institute for the past five years. The report written by Professor Wanibeld Kamm describes the trend of development of passenger cars in safety, economy, performance, comfort, terrain and winter driving qualities, and engine development. Experimental models of streamlined cars are described. Photographs, charts, and drawing are included.

PB 11490. U. S. WAR DEPARTMENT. ENGINEER BOARD. Engineer Board Letter report, Evaluation report on German prime mover. (Rpt 2254). Mar 7, 1945. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a description and evaluation of the German prime mover (SKODA) chassis no. 81247, model 1943 designed for slow speed towing and cargo hauling. This which is very similar in construction to the steel wheeled steam tractor so commonly used in farming operations in the middle west and west prior to World War I. The engine is an upright, air cooled, 4-cylinder type with overhead valves, carburetor and a magneto type ignition. Four photographs.

PB 15527. U. S. WAR DEPARTMENT. ENGINEER BOARD. Evaluation report of model trailer - German, "Schwerstlastwagon RW 40". (Rpt 2873). Jul 19, 1945. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
It is the opinion of the Technical Staff that this trailer is designed for moving over highways, heavy loads such as loaded railroad cars or track-mounted construction machinery. It could be used for heavy hauling of nearly any kind provided only paved roads were traversed. The steering mechanism appears to be very complicated. Photographs are included.

PB 18567. U. S. WAR DEPARTMENT. SPECIAL OPERATIONS. Civil affairs guide, Administration of German railroads - Appendix. (Pamphlet 31-144 - Appendix) Oct 1944. 36 p. Price: Microfilm-50¢ - Photostat-$3.00
This guide gives background information on the German railroad system including administration and personnel. A more detailed description of the German railroad system, including information on technical, traffic and operational problems, is given in the Civil Affairs Handbook on Germany, Section XI, "Transportation," B "Railroads." Annex 1 gives data on equipment production, and table 1 lists the railroad equipment firms, locations, estimated pre-war capacity, number of workers and area (square miles) in 1938, and wartime activities. Annex II lists leading personalities in railroad administration 1942-43. Chart showing organization of the German National Railroad and a short bibliography are also included.

PB 14755. WAAS, H. and EHRMANN, H. Untersuchung der laufeigenschaften des schnelltriebwagens Berlin-Hamburg. (Investigation of running characteristics of express car used on the Berlin-Hamburg route) (ALSOS Mission, Klotter File S C) Nov 1933. 36 p. Price: Microfilm-50¢ - Photostat-$3.00
The running properties of the express car were investigated under varied conditions of the rail bed and at various speeds in order to make proposals for its further development and improvement. Vibration tests were made at a number of points leading to changes in its construction. Drawings and graphs. In German.

United States

PB 15162. U. S. WAR DEPARTMENT. Safety rules: Military Railway Service, U. S. Army. (Pamphlet 55-1) Apr 1944. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
This handbook of rules for the protection of personnel and safeguarding of Government property covers the following subjects: General rules; train, engine, and yard personnel; maintenance-of-way personnel; maintenance-of-equipment personnel; linemen and signal personnel; and personnel working in electric territory; station and stores personnel.

PB 11376. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. Cargo carrier, M29C. (Rept 806) Apr 1944. 31 p. Price: Microfilm-50¢ - Photostat-$3.00
This report covers the study and tests of the M29C cargo carrier to determine its suitability for use by engineer organizations. The cargo carrier is an amphibious track-laying vehicle with a payload capacity of 1,200 pounds inclusive of the driver. The vehicle is of relatively light construction, and was developed for use over terrain considered impassable to standard types of wheeled motor vehicles. Specifications of the manufacturer, Studebaker Corporation, are given and photographs show the vehicle with the top removed and with the top in place. All the tests are discussed and fully described, as well as illustrated by seventeen photographs.

PB 11375. U. S. WAR DEPARTMENT. CORPS OF ENGINEERS. ENGINEER BOARD. First interim report on service test of trucks, 6-ton, 6 x 6, with chain-drive rear bogie. (Rept 925) Apr 1945. 17 p. Price: Microfilm-$50¢ - Photostat-$2.00
This interim report covers a partial service test of the standard Army 6-ton trucks converted to chain drive on the rear bogie and intended for use as prime movers for the 20-ton, front-loading, low-bed, machinery trailer. Subject tests were conducted at Fort Belvoir, Virginia. The tests are described in detail and cover the period from April 194 to March 1945. Photographs show the tractor truck with chain-driven rear bogie, the spare tire carrier, the fifth wheel mounting, etc.

## MARINE TRANSPORTATION

German

PB 15905. DAIMLER-BENZ A. G., STUTTGART. Beschreibung und betriebsvorschriften für den Boots-Dieselmotor Baumuster MB 518. (Description and operating instructions for Boots Diesel engine model MB 518) Jul 1944. 100 p. Price: Microfilm-$1.00 - Photostat-$7.00
This report contains a description of the 20 cylinder 2500 h.p. V Diesel engine for use on boats; its parts with all specifications and technical data, also instruction for operation and service are given. Many photographs and tables are included.

PB 15485. DEUTSCHE SCHIFF-UND MASCHINENBAU A.G. Schematische rohrpläne, Motorschiff "Leipzig", M.D.L. (Schematic piping plans, motor ship "Leipzig", M.D.L.). (Supplement 6 to PB 15477). 1938. 52 p. Price: Microfilm-$1.00 - Photostat-$4.00
Collection of 18 plans of piping and plumbing arrangements of the motor ship "Leipzig". In German.

PB 15484. DEUTSCHE SCHIFF-UND MASCHINENBAU A.G. Zweischrauben bergungsmotorschiff "Atlantic". (Twin-screw motor ship "Atlantic") (Supplement 5 to PB 15477). Dec 1939. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
Collection of 10 schematic plans of piping and plumbing arrangements on German motor ship "Atlantic".

PB 16992. GEGENUBERSTELLUNG: S-229 und Go P-60. Go P-60B mit 2TL 109011 A-0. Go P-60B mit 2TL 109011 A-0 und R-Gerat (s = 2000 kg). (Appendices 1, 2 & 3 to Army Air Forces. Tech. Intelligence Rept I 68, PB 7776). n.d. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Three graphs showing the comparison between three types of planes as to performance characteristics.

PB 14709. HEINRICH HERZ INSTITUTE FÜR SCHWINGUNGSFORSCHUNG: Artillerie Schulboot "Bremse". Lotrechte Biegeschwingung des Schieffskörpers. (Artillery training boat "Bremse". Elastic horizontal vibrations of the boat body). (ALSOS Mission, Klotter File 12 a). 1933. 24 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes the study of vibrations of the school boat "Bremse" produced both artificially and by the ship's movement. Elastic vibrations along the horizontal axis of the boat are considered at varied speed and wind conditions. Graphs.

PB 15477. HOWALDSWERKE, A. G., KIEL. Anordnung der motorenanlage, M.S. "Robert Ley" (Arrangement of the power plant of motor ship "Robert Ley"). Supplement #27 to PB 15477. 1937. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
This document is a drawing of the motor arrangements in the German motor ship "Robert Ley".

PB 16701. HUTTON, A. K. and others. Investigation of Bremen Vulcan Schiffbau und Maschinenfabrik, Vegesacke. (CIOS File XXXII-101, Item 29). n.d. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This shipyard normally builds cargo and passenger vessels for commercial operators and built no military craft or machinery prior to 1939. During the war construction completed consisted of 8 cargo ships, 2 tankers, 74 submarines type 7B and 7C and 200 submarine diesel engines. Techniques in fabrication and assembly including shop equipment, welding and manufacture of Diesel engines are covered. A large bending roll and a large press were considered unusual equipment. Illustrations have been omitted.

PB 16702. HUTTON, A. K. Report on welding in German shipyards. (CIOS File XXXII-100, Item 29). n.d. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
The following shipyards were examined and a brief report presented herein: Bremer Vulcan Yard, Deschimag Yard,-Bremen, Atlas Werke-Bremen, Kriegsmarine Werke-Wilhelmshaven, Blohm and Voss-Hamburg, Howaldtswerke-Hamburg, Fried, Krupp Germania Werft-Kiel, Deutsche Werke, Howaldtswerke-Kiel, and Deutschewerft-Finkenwärde-Hamburg. As a general statement it can be said that at the end of the war German shipyards were not as far advanced in the application of welding as are yards in the U. S.

PB 16699. HUTTON, A. K. and SMITH, EDWIN R. Theodor Leise Plant, Hamburg, manufacturers of marine propellers. (CIOS Report, File XXXII-104, Item 29). Jul 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This firm made cast iron, bronze, and cast steel marine propellers. Machine tool equipment and propeller machining procedure were in general of a conventional nature. Photographs are included. (Some drawings are omitted from this report because of delay in their receipt. Complete sets of these drawings were sent to FIAT, BIOS, TIIC, and the U. S. Navy.)

PB 16698. IRELAND, MARK L., JR. Main propulsion steam turbine machinery of German merchant vessels. (CIOS Report, File XXXII-106, Item 29). n.d. 87 p. Price: Microfilm-$1.00 - Photostat-$6.00
The most useful information obtained from this investigation consists in the basic principles and research data used in various machinery designs, the difficulties encountered, both in design and operation, and the evidence of characteristic German thoroughness in attention to details of design and construction. The body of this report is devoted to these factors with purely descriptive information held to a minimum. Details are given of main turbine features and design, reduction gears, main condensers, and propulsion machinery. Appendices include tables of machinery particulars representative of German merchant vessels, lists of references available in German and of related documents, and drawings and photographs.

PB 15160. PRATT, H. H. Interrogation of Carl Koppe of Germanischer Lloyd at Bremerhaven. (FIAT Final Rept 285). Jun - Jul 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
During the interrogation of Carl Koppe, principal ship and engine surveyor for the Germanischer Lloyd Classification Society, it was learned that the Society had been engaged in testing material for aircraft engines for the Luftwaffe, but no other inspection of aircraft was attempted by them. There was little expansion in the organization since very few merchant ships had been built since 1938. There was a considerable increase in repair work due to the war, and a number of smaller merchant type vessels were built under survey for the Navy. Welding in ship construction, substitute propeller materials and successful use of "oil packed" or oil filled stern tubes in tailshafts up to 16" in diameter were discussed. Plans mentioned in this report are not included.

PB 7457. SCHMID, R. Die verwendung der verbrennungsturbine für Schiffs-antriebe. (Application of the combustion-turbine for ships power.) (Incl. D to PB 7456.) n. d. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a bulletin of Brown, Boveri & Co., Baden, Switzerland, briefly describing the application of combustion-turbine for ships-power. It contains one drawing showing turbine installations in ships having adjustable propellers, and one drawing for ships having fixed propellers.

PB 16700. SMITH, EDWIN R. and HUTTON, ALBERT K. The manufacture of marine propellers, Blohm und Voss, Hamburg. (CIOS Report, File XXXII-103, Item 29). Jul 1945. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
In connection with investigation of Blohm und Voss, it was found that special equipment had been built during the war period for the manufacture of marine propellers. Special machine for machining submarine propeller blades are described. Photographs are included here. (Some drawings are omitted from this report because of delay in their receipt. Complete sets of them were sent to FIAT, BIOS, TIIC and U.S. Navy.)

PB 15161. SMITH, E. R. and others. Visit to Deutsche Werft Finkenwärder at Hamburg. (FIAT Evaluation Report 1199). Jul 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Although producing submarines, this yard designed and built a number of 3,000 ton HANSA ships during the war. The original design was a riveted vessel with a single 'tween deck; from it was evolved an all welded design with no 'tween deck. Eighteen ships of the riveted design were delivered but no welded ships were completed. The riveted vessels were built to Germanischer Lloyd requirements, while the welded ones are classed as a special type and have reduced scantlings, apparently in an attempt to save steel.

PB 15906. J. M. VOITH MASCHINENFABRIKEN, HEIDENHEIM Beschreibung und betriebsvorschrift zu den Reserve-Voith-Schneider-Propplern der Räumboote R17 bis R20 und Räumboote R21 bis R24 der Kriegsmarine. (Description and operational instructions of the Voith-Schneider spare propellers of Navy dredges R17 to R20 and dredges R21 to R24.) Mar 1940. 39 p. Price: Microfilm-50¢ - Photostat-$3.00

This report contains a detailed technical description of the firm's spare propellers for eight types of German Navy dredges, their parts and instructions for assembly, mounting, oiling, maintenance and operation. Design drawings are included. In German.

PB 14700. WAAS, H. Untersuchung der Biegeschwingungen von Kreutzer "Leipzig". (Investigation of elastic vibrations of cruiser "Leipzig"). (ALSOS Mission. Klotter File 12 m). 1932. 35 p. Price: Microfilm-50¢ - Photostat-$3.00
This report describes the elastic vibration measurements made at a number of points aboard the cruiser "Leipzig" before it was put into service. Vibrations were produced by a machine of the Losenhausen-Spatle type and both their frequency, amplitude and damping measured by an Askania vibrometer. Their purpose was principally to determine the resonant frequency of the ship and its resistance to vibrations of various frequencies.

PB 14699. WAAS, H. Kreutzer "Leipzig". Schwingungsmessungen während der Fahrt. (Cruiser "Leipzig". Oscillation measurements during movement). (ALSOS Mission, Klotter File 12 n). 1933. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
This report presents the results of vibration measurements during sailings of cruiser "Leipzig". Body vibrations were measured at varied speed and also separately when the ship was driven by any combination of the ship's three propellers.

PB 14701. WAAS, H. Untersuchung der Mastschwingrugen von Kretzer "Leipzig". (Investigation of mast vibrations on cruiser "Leipzig"). (ALSOS Mission, Klotter File 2 l). 1933. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes the arrangements and results of vibration measurements at various points of the mast of the cruiser "Leipzig" due to gun recoil. The influence of varied weight of mass at the free end of the mast on its vibration and its damping was especially studied.

PB 14707. WAAS, H. and REHMANN, H. Die Schwingungserscheinungen an den Motorenfundamenten und an der Beobachtungsgerätau auf Artillerieschulbot "Bremse". Oscillations of motor foundations and observation instruments aboard trainer ship "Bremse". (ALSOS Mission, Klotter File 12 C). 1934. 30 p. Price: Microfilm-50¢ - Photostat-$2.00
In this paper, measurements of oscillations are described which were made on a training ship going at various speeds and also with motors standing still. Particular attention was being paid to sighting instruments. Methods to counteract the results of oscillation are proposed. Oscillograph records are enclosed.

PB 14702. WAAS, H. and REHRMAN, H. Kreutzer "Koln". Schwingungsmessungen während der Fahrt. (Cruiser "Koln". Oscillation measurements during movement). (ALSOS Mission, Klotter File 12 k). 1934. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
Method and results of vibration measurements at various points of cruiser "Koln" are described in this report. Separate measurements were made at varied speed and various wind angles.

PB 14705. WAAS, H. and CORSTEN, M. Schwingungsmessungen on den Beobachtungsgeräten beim Kaliberschiessen auf Panzerschiff "Deutschland". (Oscillation measurements on observation instruments at trial firing on armored ship "Deutschland") (ALSOS Mission, Klotter File 12g). 1934. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes the methods and results of measurements of vibration caused by the firing of guns and torpedoes aboard armored ship "Deutschland". In addition to measurements on observation and sighting instruments also the vibrations of the hull of the ship were measured and recorded. A specially constructed, less sensitive oscillograph was used. Oscillograms are enclosed in the report.

PB 14706. WAAS, H. and FUHRE, H. G. Panzerschiff "Deutschland". Schwingungsmessungen während der Fahrt. (Armored ship "Deutschland". Oscillation measurements with ship in motion). (ALSOS Mission, Klotter File 12 f). 1934. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Six oscillographs were used to measure the vibration of the ship body due to driving motors and propellers, moving at varied speed, wind direction and condition of the sea. Results on "Deutschland" measurements are compared to previous measurements on other ships. Vibration frequency were found to range from 3.8 to 40 cycles per second.

### United States

PB 7458. WAHL, C. G. Brown Boveri turbines for the propulsions of merchant vessels. n. d. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
The new merchant shipping to be built after the war will involve rapid delivery of suitable propelling machinery. The Brown Boveri two cylinder marine turbine with double reduction gear for outputs up to 8000 s.h.p. per propeller shaft is described, which in virtue of its low steam consumption and reliable robust construction is particularly suited to the propulsion of merchant ships. Development in the design of exhaust-steam turbine sets are also dealt with. Photographs and diagrams are included.

PB 16836. U. S. ARMY AIR FORCES. AIR TECHNICAL SERVICE COMMAND. One-man rubber air/sea raft no. FL 410.201. Maintenance and operation folder. (T-2 Translation 390). Feb 1943. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
The one-man rubber raft, or E-boat, serves as rescue equipment after a parachute jump above water. The rubber raft is worn on the back, in a single casing, with 2 straps and a belt, and is independent of the parachute. It is inflated with $CO_2$ from a flask which is also inside the casing. Anti-capsizing bag at the head must be filled with water to prevent capsizing when climbing in. Driving anchor, bailing dipper and line are tied to the raft in pockets. Operation, maintenance, packing regulations and storage of the raft are each taken up. Table of figures and diagram are listed but are not included in the report.

## MISCELLANEOUS

### Belgian

PB 15975. U. S. ARMY. CORPS OF ENGINEER. ENGINEER BOARD. Evaluation report of extinguisher, fire, hand-operated, "Minimax", 1 liter capacity - Belgium, EB Rep 10004. Jun 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Subject extinguisher is of the carbon tetrachloride pressurized-type consisting essentially of a cylinder and a discharge head. It compares favorably with the U. S. standrad one-quart pump-type extinguisher of the same general type, but is not considered superior because its operation is dependent upon holding a charge of compressed air at all times. Photograph is given.

PB 15976. U. S. ARMY. CORPS OF ENGINEERS. ENGINEER BOARD. Evaluation report of extinguishers, fire, hand-operated, conical shape, MINIMAX, 9 liter capacity, Belgian, EB Rep 10003. Jun 1945. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
The subject extinguisher is of the soda-acid type and consists of a 9-liter conical body with a discharge nozzle at its point and a plunger on its base. The overall consturction makes its operation simple and quick. Hung on the wall with the nozzle up, it can be grabbed with one hand and dropped to the floor where the plunger strikes, putting the unit in operation. It can then be directed with one hand. Photographs are included.

### French

PB 7935. GEIGER, FRED W. Interrogation of Dr. F. Ringleb at St. Germain, France, 30 July 1945. (Army Air Forces. Tech Intel Rept 1-79). 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00

This report deals with the following subjects: (1) An observation regarding the kinetic energy in adiabatic flow; (2) an approximate method for finding the flow past a two-dimensional diffusor; (3) two-dimensional flow with the addition of heat.

PB 9639. SALANT, E. O. and BRODE, W. R. Interview 8 September 1944 with M. Jean Lecomte, Directoire du Laboratoire des Recherches Physiques a la Sorbonne. (Army Intelligence Division Report 3461). 1944. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
From an interview with Professor Lecomte it was learned that he had done work with infra-red analysis of oil, but had done nothing since the arrival of the Germans into Paris.

German

PB 14673. ANFACHUNG von schwingungen bei einem hydrodynamischen vorgang. (Formation of oscillations through a hydrodynamic process). (ALSOS Mission Klotter File 3A). n.d. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This brief note attempts to determine the dimensions of a rod which when moving through water at a relative velocity "v" should not set up a wake with a frequency approaching resonance with itself and thereby causing its breaking.

PB 7459. BBC Wasserbremse CB (Brown Boveri & Co. Water brake CB chart). Jun 1944. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
This inclosure to PB 7456 consists of a chart for calculating Type CB water brake.

PB 14524. DEUSS, EDWARD L. German employment statistics during the war. (FIAT Final Report 537). 1945. 106 p. Price: Microfilm-$1.50 - Photostat-$6.00
Throughout the war there were kept 4 sets of statistics: the Reports of Industry based on factory units and compiled by Trade and Manufacturers' Associations, Employment Reports based on factory units and compiled by product groups or end products, bookkeeping records of the Minister of Labor, and the Manpower Balance Sheets of the Statistisches Reichsamt, the most comprehensive and most objective. Each of these sets of statistics is described in detail. Appendices contain tables of statistics.

PB 13168. GERMANY. REICHSFORSCHUNGSRAT. Das Ahnenerbe. (Correspondence from SS Antropological Institute). (RFR 1). 1942-1944. 17 p. Price: Microfilm-50¢ - Photostat-$2.00

PB 13170. GERMANY. REICHSFORSCHUNGSRAT. Dr. Asmis. (Administrative correspondence with Dr. Asmis, concerning monetary grant for project, "Religious-politics of European colonial powers"). (RFR 3). 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00

PB 13162. GERMANY. REICHSFORSCHUNGSRAT. Dr. Wehefritz. (NSDAP correspondence concerning political reliability of Dr. Wehefritz). (RFR 57). 1937. 4 p. Price: Microfilm-50¢ - Photostat-$1.00

PB 14670. KOTOWSKI, G. Bericht über die stabilität der lösungen Hillscher differentialgleichungen mit drei unabhängigen parametern. Erste mitteilung: über die gleichung $y''+(\lambda+\gamma_1\cos x+\gamma_2\cos 2x)y=0$. (Report on the stability of the solutions of Hill's differential equations with three independent parameters. First communication: on the equation, etc.) (ALSOS Mission. Klotter File 5A) Feb 1943. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
Since differential equations with periodical coefficients are gaining ever greater importance, especially in their technical application, their numerical evaluation has become a necessity. However, since this is a cumbersome and time-consuming mathematical operation and the available numerical material very incomplete, it was the purpose of the present investigation (1) to determine the influence of the introduction of a third parameter upon the stability of the solutions, and (2) to calculate the $\lambda$ values of the marginal curves $C_0$, $C_{1/2}$, $S_{1/2}$, $C_1$, and $S_1$ for the $\gamma_1$ and $\gamma_2$ values 0.0, 0.5, 1.0, and 1.5. The essence of the evaluating process are the four fundamental equations: $y=\sum_0^\infty A_\nu \cos \nu x$;

$y=\sum_1^\infty B_\nu \sin \nu x$; $y=\sum_0^\infty A \frac{2\nu+1}{2} \cos \frac{2\nu+1}{2} x$;

$y=\sum_0^\infty B \frac{2\nu+1}{2} \sin \frac{2\nu+1}{2} x$. Drawings and photographs included.

United States

PB 17398. BALDWIN, RUSSELL J. National research council of Japan. (Ordnance Technical Intelligence Rept 20) 1946. 38 p. Price: Microfilm-50¢ - Photostat-$3.00
This is a study of the organization, National Research Council of Japan, established in 1920 and engaged in scientific and technical research. This study, together with the translation of the fields of research, is presented as a report to augment reference data available to other investigating agencies. Only those divisions whose work is of interest to Ordnance are presented.

PB 17516. BALLOWE, JAMES M. An adaptation of statistical quality control at Aldens'. (Carnegie Institute of Technology. Quality Control Reports 7) Sep 1945. 12 p. Limited free distribution; thereafter, microfilm-50¢ - photostat-$1.00
This report, one of a series designed to aid American war industries in utilizing improved methods of statistical quality control, describes operations in Aldens' Chicago Mail Order Company and use of quality control charts in various departments. Sampling procedure and educational program are discussed. Tables of data and control charts are given.

PB 15786. BIGELOW, M. H. Plastic items used on military gas masks. (CWS Tech Div Memo Rept 624) Apr 1943. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This report presents the findings of a survey of the use of plastic components in service and other gas masks. Recommendations are made for changes in the M8 valve, diaphragm angle tube and lenses.

PB 17521. BURR, IRVING W. Some experiments illustrating principles of quality control. (Carnegie Institute of Technology. Quality Control Reports 12) Sept 1945. 12 p. Limited free distribution; thereafter, microfilm-50¢ - photostat-$1.00
This report, one of a series designed to aid American war industries in utilizing improved methods of statistical quality control, discusses the laws of probability, and describes experiments illustrating kinds of sampling and fraction defective charts. Acceptance sampling by control chart is also discussed. Tables of data and control charts are given.

PB 7961. CONNOR, R. F. Propeller anti-icing test program in the NACA Icing Tunnel, AERL, Cleveland, Ohio. (Army Air Forces Eng Div, ENG-52-581-203). 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This conference between representatives of the Material Command and the NACA Aircraft Engine Research Laboratory was held to discuss the propeller anti-icing research program to be conducted in the NACA icing tunnel. After a preliminary discussion on the progress of construction, an extensive tour was made through the completed parts of the tunnel and the operation of the various pieces of equipment was explained in detail. The conference was resumed with a discussion of natural icing conditions which might be duplicated in the subject tunnel. Proposed calibration and tunnel tests are described.

PB 17518. CRAWFORD, JAMES R. and HAGGER, PRESTON C. Statistical quality control at Lockheed. (Carnegie Institute of Technology. Quality Control Repts 9) Sep 1945. 17 p. Limited free distribution; thereafter, microfilm-50¢ - photostat-$2.00
Some experiences at Lockheed in introducing statistical methods of quality control are reviewed. Several practical applications which may be of value to other organizations are described. Control charts, diagram of landing gear trunnion, and tables of data are included. This report is one of a series designed to aid American war industries in utilizing improved methods of statistical quality control.

PB 16792. DÖRING, H. and HORNBERGER, W. Explosive decompression from 3000 m. (9842 ft.) to 8000-15,000 m. (26,246-49, 212 ft.) simulated altitude. Effect on man. (A translation from the German.) n. d. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
308 experiments on man have been made on the effect of rapid decompressions from 3000 m.(9842 ft.) up to 8000-15,0000 m. (26,246-49,212 ft.) simulated altitude. The rate of decompression corresponded to that which is to be expected in cases of destruction of whole window panes from pressure cabins and it was 0.1 second from 3000 to 9000 m.(9842 to 29,527 ft.) and 0.25 second from 3000 to 15,000 m.(9842 to 49,212 ft.) The expected release of gas in the body fluids and in tissues did not occur. The effects due to inflated bowels are tolerable. In two cases, in which the glottis was probably closed, the decompression apoplexy resulted, a transient illness similar to apoplexy.

PB 11578. ERRICH, F. P. Quick test for fingerprint residues. (Army Air Forces. Eng Div ERT 4 - 117). Sep 1945. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Comparative tests of the sensitivity of iodine vapors and the humidity cabinet exposure method as a quick test for the presence of fingerprint residues on a metal surface. The iodine vapor method was more sensitive. Table of data given.

PB 17517. FAY, E. L. An application of statistical quality control at the John Deere Tractor Company. (Carnegie Institute of Technology. Quality Control Repts 8). Sep 1945. 9 p. Limited free distribution; thereafter, microfilm-50¢ - photostat-$1.00
Experiences in the introduction of quality control by statistical methods at the John Deere Tractor Company are outlined. Application of control charts to piston pin operations and to an automatic screw machine are described. Photographs and control charts are included. This report is one of a series designed to aid American war industries in utilizing improved methods of statistical quality control.

PB 17510. FIZZELL, JAMES A. Introduction of statistical quality control at Illinois Testing Laboratories. (Carnegie Institute of Technology. Quality Control Reports 1) May 1945. 8 p. Limited free distribution; thereafter, microfilm-50¢ - photostat-$1.00
How a small company employing less than 250 persons was aided by the introduction of statistical quality control is described in this report, one of a series designed to aid American war industries in utilizing improved methods of statistical quality control. Control charts and data sheet illustrate the text.

PB 17520. GOODFELLOW, DOROTHY W. Bibliography on statistical quality control. (Carnegie Institute of Technology. Quality Control Reports 11) Sep 1945. 48 p. Limited free distribution; thereafter, microfilm-50¢ - photostat-$1.00
This bibliography is divided into three sections: Part I lists titles taken from periodicals and journals, Part II, technical and industrial publications, and Part III, material published in book form.

PB 17397. GREAT BRITAIN. MINISTRY OF SUPPLY. DIRECTORATE OF ATOMIC ENERGY. Summary of report on nuclear physics by Dr. Bothe. (C. P. V. A. Report 6) 1946. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This abstract indicates that the report by Dr. Bothe consists of the following sections: A - a report on protection from radiation by W. Bothe; B - reprint of a trivial paper by Bothe on artificial radio activity induced in the rare earths by thermal neutrons; C - reprint of a paper by Bothe and Ratzel on single scattering of fast electrons in aluminum and nickel; D - reprint of paper by Bothe on neutron indicators; E - reprints of 2 papers by Bothe on diffusion of neutrons; F - reprint of a paper by Bothe and Gentner on upper limit of the fission neutrons from uranium; G - reprint of paper by Flammersfeld, Jensen and Gentner on the distribution of neutrons and the production of energy in uranium fission; H - reprint of paper by Maier-Leibnitz on measurements with radio-active sodium; I - reprint of paper by Jensen on the question whether helium of atomic weight five exists; J - report by Jensen and Ritter on the slowing down and absorption of neutrons in concrete; L - reprint of paper by Fleischman on vapour pressure measurement by means of the thermal diffusion apparatus; and M - enrichment of heavy nitrogen by the thermal diffusion apparatus.

PB 16607. GURNSEY, E. C. Humidity cabinet testing equipment. (Army Air Forces. Eng. Div. TSEAL 4-4-498) 1945. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
Newly developed high humidity exposure equipment at the Air Technical Service Command should be used as standard since it indicates a high degree of reproducibility of results. Seven curves of test results and a comparison of the old and new humidity cabinets make up the appendices. A reference compound to be used as a secondary standard for rust resistant compounds, should be developed until the reproducibility of results at all laboratories can be demonstrated. A photograph of the equipment is included.

PB 17512. KAUFFMAN, LESTER A. Statistical quality control at the St. Louis division of American Stove Company. (Carnegie Institute of Technology. Quality Control Repts 3) Aug 1945. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
Some of the specific ways in which statistical methods were used at the St. Louis plant of the American Stove Company are discussed in this report, one of a series designed to aid American industries in utilizing improved methods of statistical quality control. These procedures were used in controlling the machining of bomb fittings, reducing inspection on threading operation, reducing manufacturing cost for jettison fuel tanks, improving fragmentation bomb assemblies. Tables, graphs of data and control charts are given.

PB 12154. KELLER, F. S. The radio code research project. Final report of Project SC-88. (OSRD Rept 5379). 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This report outlines a project of study of code-receiving practice, the relative effectiveness of different methods of code-sending instructions, standardization of code-school graduation requirements and the retension of code-receiving skill largely based on data collected at Central Signal Corps Training Center, Camp Crowder, Missouri.

PB 15616. KLOTZ, IRVING M. Factors in canister design and tube testing: critical bed depth and the nature of gas flow through charcoal: Progress rept to May 18, 1944. (OSRD Rept 3774) Jun 1944. 24 p. Price: Microfilm-50¢ - Photostat-$2.00
This paper is an engineering study of the rate-controlling processes in the removal of gas from an air stream. Effects of diffusion in the gas stream and of reaction at the absorbent are separately evaluated. The results find practical application in affording a better understanding of the effects of flow rate and mesh size on canister protection. Graphs and tables are included. This is a progress report under contract with Northwestern University.



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